

CODE OF PRACTICE

Distributed Power Freight Trains



Document details

First published as: Distributed Power Freight Trains

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

Notice to users

This Code of Practice has been drafted for use by rail operators and the rail industry on the Australian rail networks as defined in this code in conjunction with, or to supplement, the existing codes of the rail organisations.

The Rail Industry Safety and Standards Board (RISSB) and all persons acting for the RISSB in preparing the Code disclaim any liability or responsibility to any person for any consequences arising directly or indirectly from the use by the rail industry or rail organisations of the code in whole or in part, and whether or not in conjunction with, as a supplement to, the codes which the rail industry currently use.

The RISSB expressly excludes to the fullest extent permitted at law all warranties whether express or implied, at common law and statute as to the fitness for purpose of the code to the rail user for the intended purpose.

Users of the code should be aware that, while using the code, they shall also comply with any relevant Commonwealth, State or Territory legislation relevant to their operations. Adherence to the code does not replace or exclude the application of such legislative requirements. The code is intended to be normative, however users are responsible for making their own enquiries in relation to the application of legislation, and the framers of the code accept no responsibility in this regard.

Adherence to the code does not necessarily ensure compliance with any relevant national standards and other codes of practice. Users are responsible for making their own enquiries in relation to compliance with national standards and other codes of practice. To the extent of any inconsistency between this code and the laws of a relevant State, Territory or the Commonwealth and any binding rules or regulations of the State, Territory or Commonwealth, the laws of that State, Territory or Commonwealth shall prevail to the extent of the inconsistency between this code and those laws.

While all reasonable care has been taken in the preparation of this code, it is provided to rail operators without any legal liability (including but not limited to liability for negligence) on the part of the RISSB and the RISSB and the publishers, authors, and editors of the code (and their consultants) take no responsibility for loss suffered by any person resulting in any way from the use of, or reliance on, this publication. Responsibility rests with the rail organisation to ensure that all aspects of the code are safe.

Copyright

© RISSB

All rights are reserved. No part of this work is to be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of RISSB, unless otherwise permitted under the Copyright Act 1968.

Document Control

Identification

Version	Version	Date
Code of Practice for Distributed Freight Trains	1.0	10 July 2018

Document History

Publication Version	Effective Date	Reason for and Extent of Change(s)
1.0	10 July 2018	First published

Approval

Name	Date
Rail Industry Safety and Standards Board	10 July 2018

Contents

1	Introduction.....	6
1.1	Introduction.....	6
1.2	Purpose.....	6
1.3	Scope.....	6
2	References documents.....	7
2.1	Normative references.....	7
2.2	Informative references.....	7
2.3	Definitions.....	8
3	Risk management.....	9
4	Train forces.....	10
4.1	General.....	10
4.2	Analysis.....	10
4.3	Crew training and competency.....	11
4.4	Synchronous and asynchronous control.....	11
4.5	Distributed power train operations management.....	11
4.6	Environmental conditions.....	11
4.7	Network conditions.....	11
4.8	Risk assessment.....	12
4.9	Continual improvement.....	12
5	Network interface requirements.....	12
5.1	Assessing/approving rolling stock suitable for infrastructure.....	12
5.2	Network rules.....	12
5.3	Long trains.....	12
5.4	Train forces.....	13
5.5	Requirements on the RSO for network access for long DP trains.....	13
5.6	Continual Improvement.....	14
6	Distributed power systems.....	14
6.1	Common requirements for all distributed power operations.....	14
6.2	Bank locomotive distributed power.....	14
6.3	Manual distributed power.....	14
6.4	Common requirements for automated distributed power.....	15
6.5	Wired distributed power system (WDP).....	15
6.6	Radio frequency distributed power systems (RFDP).....	15
6.7	Alternative systems.....	16
7	DP train planning.....	16
8	Maintenance.....	17
9	Continual improvement.....	17

Appendices

Appendix A	Distributed power hazard identification.....	18
Appendix B	Train force analysis logic diagram	19
Appendix C	Guideline notes for long train dynamic analysis	20

1 Introduction

1.1 Introduction

In freight rail operations, the term 'distributed power' refers to the practice of placing locomotives at more than one location within the train. Such practice is differentiated from conventional freight train practice where all the locomotives are marshalled at the front of the train, a configuration known as 'head end power'. Distributed power trains may take many different configurations to suit various purposes including the following examples:

- (a) Push-pull arrangement with one or more locomotive at each end.
- (b) 'Bank locomotive' arrangement with temporary locomotives pushing from the rear to assist on ascending grades.
- (c) Long trains with locomotives distributed at several locations along the train, often in groups known as 'consists'.

Each configuration may suit a different purpose. For example, a push-pull configuration enables the direction to be easily reversed for operational convenience and the use of bank locomotives is convenient where extra tractive effort is required at one location only. Distributed power enables an increase in train length which would otherwise be limited by the traction, coupler and brake limits of using head end power only. Distributed power therefore has the advantage of reducing in-train forces by distributing traction and braking forces along the train.

1.2 Purpose

The purpose of this document is to establish a code of good practice for stakeholder activities related to the operation of distributed power freight trains.

1.3 Scope

This Code of Practice covers activities related to the operation of distributed power freight trains. It is intended as a guidance document and contains high level functional recommendations rather than prescriptive requirements.

This Code of Practice is intended to cover most types of distributed power trains and considers manual distributed power, as well as wired and radio frequency type distributed power systems (WDP, RFDP). It does not exclude other types where it can be demonstrated that safety and network interface requirements can be met.

This Code of Practice does not cover the requirements for fully automated driverless trains ie the process for automating driver functions as carried out by the crew in the lead locomotive. However, some of the content may be applicable to driverless distributed power freight trains recognising that control is affected by means other than on-board crew.

Users of this Code of Practice should not rely solely on this document and are required to satisfy themselves that all relevant risks have been identified and risk controls adopted are satisfactory for their specific distributed power train operations.

This code of practice refers to established WDP and ECP standards and practices developed under the Association of American Railroads (AAR) Manual of Standards and Recommended Practices (MSRP) including commercial WDP and ECP systems developed to comply with the AAR standards. However, this Code of Practice does not exclude the adoption of alternative WDP and ECP systems which may not comply with the AAR standards, on condition that suitable assurance is provided that an equivalent or superior level of safety is achieved in operations. It should be noted that at the time of writing, the AAR did not have published