

In Line Refuelling

Guideline



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.

Document Control

Identification

Document Title	Version	Date
Guideline for In Line Refuelling	1.0	21 September 2017

Document History

Publication Version	Effective Date	Page(s) Affected	Reason for and Extent of Change(s)
1.0	21/09/2017	All	New publication

Approval

Name	Date
Rail Industry Safety and Standards Board	21 September 2017

Copyright

© RISSB

All rights are reserved. No part of this work may 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.

Table of Contents

1.	Introduction	3
1.1.	General	3
1.2.	Purpose	3
1.3.	Scope	3
1.4.	Definitions	3
2.	Design of in line refuelling systems.....	4
2.1.	Design goals for in line refuelling systems.....	4
2.2.	General design.....	4
2.3.	Fuel tender design	6
2.4.	Locomotive design	10
3.	System operation	11
3.1.	Functional operation	11
3.2.	Crew procedures.....	13
3.3.	Maintenance and test.....	13

In Line Refuelling Preview

1. Introduction

1.1. General

In line refuelling of diesel locomotives from an attached fuel tender has been implemented by several rail operators to provide greater operational flexibility and reduce costs. This Guideline has been developed to provide guidance on a minimum set of design and maintenance criteria that will enable safe operation of such systems.

1.2. Purpose

This Guideline is intended as an aid to Australian rail operators to describe common practice for the design, manufacture and maintenance of in line refuelling (ILR) systems.

This Guideline is intended to address the following hazards:

- a) A functional failure of the in line refuelling system during fuel transfer leading to overfilling of the locomotive fuel tank or over pressurisation with a consequential fuel spill with the potential for ignition and fire.
- b) Failure of piping, hoses, couplings or tender tank leading to a major fuel spill sufficient to be classed as a direct environmental hazard.
- c) Potential for ignition by hot components (such as brake blocks) or electrical equipment in the instance of a fuel spill.
- d) Operation of the fuel tender in a partially filled state during the journey leading to changes in the centre of gravity sufficient to cause a derailment.
- e) Fuel tender tank shells or piping damage during a derailment sufficient to cause loss of tank integrity and a major fuel spill sufficient to be classed as a direct environmental hazard, with the potential for subsequent ignition and fire.
- f) Reduction in weight from progressive defueling sufficient to cause dynamic in train forces or centre of gravity changes (separately or in combination) to derail the tender.
- g) Train separation between tender and locomotive leading to failure of interconnecting hoses or connectors and a major fuel spill.

The requirements and recommendations of this Guideline should be used as the basis to design, and to develop maintenance procedures for, ILR systems.

1.3. Scope

This Guideline applies to diesel locomotives and associated fuel tenders that have been designed to, or modified to, utilise ILR operations. This Guideline is intended for application to new or modified diesel locomotive design on all Australian railways (except sugar cane and light railways), but each operator may choose whether or not to adopt the information contained within this Guideline.

The scope of this Guideline is limited to the design, construction and maintenance of ILR systems.

1.4. Definitions

For the purposes of this Guideline the definitions given in the Australian code of practice – glossary of Railway terminology [37] shall apply. The following definitions are specific to this Guideline.

Empty Mass: The mass of the fuel tender without the fuel load. The tare mass of the wagon plus the mass of the tanktainers, pumps and plumbing and ILR system equipment.