Technical Report

ISO/TR 18155

First edition
2025-11

Railway applications — Principles of train detection for operations and services

Applications ferroviaires — Principes de détection des trains pour les opérations et services

Reference number
ISO/TR 18155:2025(en)

© ISO 2025



COPYRIGHT PROTECTED DOCUMENT

© ISO 2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ..... **iv**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **1**

4 Operational aspects regarding train detection **1**
4.1 General 1
4.2 Application situation of train detection in operations 2
4.3 Impacts of train detection on operations 2
4.3.1 Impacts of train detection on operation safety 2
4.3.2 Impacts of train detection on operation efficiency 3
4.4 Combined application of train detection methods 3

5 Application of train detection **3**
5.1 General principles of train detection related methods 3
5.1.1 Categorization 3
5.1.2 Operational characteristics 4
5.1.3 Environmental conditions 4
5.1.4 Principles under normal operation 4
5.1.5 Principles under degraded operation 5
5.1.6 Selection principles 5
5.2 Operational and environmental conditions affecting train detection methods 6
5.3 Impact of train detection method on normal and degraded operations 8
5.3.1 Operation management guidance in normal situations 8
5.3.2 Operation management guidance in degraded situations 10
5.4 Possible selection criteria for train detection method 11
5.4.1 Selection criteria 11
5.4.2 Application in practice 12

Bibliography **14**

© ISO 2025 – All rights reserved

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 269, *Railway applications*, Subcommittee SC 3, *Operations and services*.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

© ISO 2025 – All rights reserved

Railway applications — Principles of train detection for operations and services

1 Scope

This document describes the general principles of train detection for operations and services which are applied to any railway. This document provides the link of train detection with management of operational principles. It includes descriptions of operational and environmental conditions affecting train detection and impacts on operations.

This document provides non-technical guidance for supporting the choice of a suitable train detection method relating to railway operations, for new lines and upgrade or renewal of train detection systems.

This document excludes all technical aspects.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
train detection
safe recognition of the presence or absence of any trains on a defined section of the track or at a given point

[SOURCE: IEC 62290-1:2025, 3.1.41]

4 Operational aspects regarding train detection

4.1 General

The detection of the presence of train contributes to the avoidance of collisions and derailment. Different methods of train detection will contribute to a different extent. Operation is dependent on the position information of trains, therefore some means of train detection are used.

Figure 1 outlines the boundaries of train detection for operations and services.

© ISO 2025 – All rights reserved