Requirements for Data Recorders on Trains

Synopsis
This document mandates requirements for the provision and functionality of data recorders on trains.
Requirements for Data Recorders on Trains

Issue record

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<td>One</td>
<td>01 June 2002</td>
<td>Original document Supersedes GO/RT3272 issue two sections 4, 5, 6 and 7.</td>
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<td>Two</td>
<td>07 June 2014</td>
<td>Replaces issue one Mandates compliance with BS EN 62625-1:2013 for the equipment requirements; the information to be recorded aligns with that required by the OPE TSI.</td>
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Revisions have not been marked by a vertical black line in this issue because the document has been revised throughout.

Superseded documents

The following Railway Group documents are superseded, either in whole or in part as indicated:

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<td>GM/RT2472, issue one, June 2002 Data Recorders on Trains – Design Requirements</td>
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GM/RT2472 issue one ceases to be in force and is withdrawn as of 03 December 2015.

Supply

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Part 1  Purpose and Introduction

1.1  Purpose

1.1.1  This document mandates requirements for the provision and functionality of data recorders on trains.

1.1.2  This document supports the Operation and Traffic Management Technical Specification for Interoperability (OPE TSI), which sets out (in 4.2.3.5) requirements applicable to data recording. Key objectives include:

   a)  Supporting systematic safety monitoring as a means of preventing incidents and accidents.
   b)  Identifying driver, train and infrastructure performance in the period leading up to and (if appropriate) immediately after an incident or accident, to enable the identification of causes related to train driving or train equipment, and supporting the case for new or changed measures to prevent recurrence.
   c)  To record information relating to the performance of both the locomotive / traction unit and the person driving.

1.1.3  Both the published High Speed Rolling Stock Technical Specification for Interoperability (HS RST TSI) (in clause 4.2.7.10) and the published Conventional Rail Locomotives and Passenger Rolling Stock Technical Specification for Interoperability (CR LOC&PAS TSI) (in clause 4.2.9.6) contain requirements for the provision of data recording devices; however, the specification of the recording device is an open point.

1.1.4  The LOC&PAS TSI, which will replace both the HS RST TSI and the CR LOC&PAS TSI, includes a specification for the recording device.

1.1.5  This document adopts the requirements of the LOC&PAS TSI and applies where an upgrade of an existing data recorder, or the fitment of European Rail Traffic Management System (ERTMS), is proposed. This standard does not mandate the integration of ERTMS requirements within existing OTDRs.

1.2  Introduction

1.2.1  Supporting documents

1.2.1.1  There are no Rail Industry Guidance Notes or Rail Industry Approved Codes of Practice supporting this Railway Group Standard.

1.3  Approval and authorisation of this document

1.3.1  The content of this document was approved by Rolling Stock Standards Committee on 11 April 2014.

1.3.2  This document was authorised by RSSB on 30 April 2014.
Requirements for Data Recorders on Trains

Part 2 Requirements for Data Recorders on Trains - Information to be Recorded

2.1 Information to be recorded

2.1.1 Data to be recorded

2.1.1.1 In addition to the requirements of clause 3.1.1.2, as a minimum, the following data, where available at the data recorder position, shall be recorded:

a) The passing of signals at danger or ‘end of movement authority’ without authority (where such data is available on the train).

b) Initiation of a brake application by Control, Command and Signalling (CCS) train protection systems and the source of that initiation, including such systems as European Train Control System (ETCS), Automatic Warning System (AWS), Train Protection and Warning System (TPWS) or mechanical train stops.

c) For each braking demand, the level being demanded (full service, Emergency etc) and from where it is being demanded.

d) The means of brake demand transmission along the train (for example, brake pipe, train control lines for brakes).

e) Brake level achieved, for example brake cylinder pressure.

f) Traction demand, the level being demanded and from where it is being demanded.

g) Traction transmission along the train (for example, train control lines for full tractive power demand).

h) Traction level achieved.

i) Speed at which the train is running.

j) Initiation of a brake application by on board safety systems, including those related to driver activity monitoring, and the source of initiation.

k) Any isolation or overriding of the on board train control (signalling) systems or other safety system.

l) Operation of the audible warning device (horn).

m) Operation of passenger or train crew door controls (release, closure etc).

n) Passenger door command transmission along the train (for example, train control lines for doors).

o) Passenger door status.

p) Safety detection by on board systems (for example, hot axle box detectors, fire alarms).

q) Activation of the passenger alarm and the location on the train where initiated.

r) Operation by the driver of the passenger alarm acknowledgment.
2.1.1.2 Annex F of BS EN 62625-1 provides a check list of monitored and recorded data.

2.1.2 Processes to match data

2.1.2.1 It shall be possible to match recorded data to:

a) The date and time of the recording.

b) The geographic location of the event being recorded (distance in miles and / or kilometres from a recognisable location).

c) The vehicle identification.

d) The train running number.

e) The identity of the driver.

f) The identity of the cab for which the recorded data is applicable.
Part 3 Requirements for Data Recorders on Trains - Equipment Requirements

3.1 Equipment requirements

3.1.1 Design and labelling

3.1.1.1 The data recorder shall be compliant with the following parts of BS EN 62625-1.

3.1.1.2 Functional requirements as specified in:

- Clause 4.2.1 (Record train data, including Annex F)
- Clause 4.2.2 (Ensure on board protection of recorded data)
- Clause 4.2.3 (Ensure retrieval of recorded data)
- Clause 4.2.4 (Enable recorded data analysis)

3.1.1.3 The integrity (consistency, correctness) of the recorded and extracted data as specified in:

- Clause 4.3.1.4 (On Board Driving Data Recording System (ODDRS) availability and reliability)

3.1.1.4 Data integrity safeguarded as specified in:

- Clause 4.3.1.5 (Non tampering, non-alteration and security of records)

3.1.1.5 The level of protection that applies to the protected storage medium shall be in accordance with parameter ‘A’ as defined in:

- Clause 4.3.1.7 (Recorded data survivability).

3.1.2 Visible indication

3.1.2.1 There shall be a means of visible indication in the driving cab that the data recorder is operative whilst the train is in service, as set out in clause 4.2.5.1 of BS EN 62625-1 (Optional Functions – Display ODDRS status to the driver).

3.1.3 Non-volatile storage medium requirements

3.1.3.1 The non-volatile storage medium shall be orange as defined in RAL 2003 as set out in clause 4.2.5.2 of BS EN 62625-1 (Optional Functions – Make easy the recognition of the non-volatile storage medium).

3.1.4 Data input class

3.1.4.1 All data inputs shall be class R1, as set out in clause 4.3.1.2.2 of BS EN 62625-1 (Recording performance).
Part 4  Application of this document

4.1  Application - infrastructure managers

4.1.1  There are no requirements applicable to infrastructure managers.

4.2  Application - railway undertakings

4.2.1  Scope

4.2.1.1  The requirements of this document apply to all vehicles fitted with a cab, and all vehicles within a fixed formation unit where any vehicle in that formation has a cab.

4.2.1.2  Where it is known, or becomes known, that existing data recorders do not comply with the requirements of this document, action to bring them into compliance is required when an existing data recorder is undergoing upgrade or renewal (as defined in the Railways (Interoperability) Regulations 2011).

4.2.2  Exclusions from scope

4.2.2.1  The requirements in this document are not applicable to possession-only rail vehicles.

4.2.3  General compliance date for railway undertakings

4.2.3.1  This Railway Group Standard comes into force and is to be complied with from 03 December 2015.

4.2.3.2  After the compliance date, or the date by which compliance is achieved if earlier, railway undertakings are to maintain compliance with the requirements set out in this Railway Group Standard. Where it is considered not reasonably practicable to comply with the requirements, permission to comply with a specified alternative should be sought in accordance with the Railway Group Standards Code.

4.2.4  Exceptions to general compliance date

4.2.4.1  There are no exceptions to the general compliance date specified in 4.2.3 for railway undertakings.

4.3  Health and safety responsibilities

4.3.1  Users of documents published by RSSB are reminded of the need to consider their own responsibilities to ensure health and safety at work and their own duties under health and safety legislation. RSSB does not warrant that compliance with all or any documents published by RSSB is sufficient in itself to ensure safe systems of work or operation or to satisfy such responsibilities or duties.
Requirements for Data Recorders on Trains

Definitions

Data recorder
For the purpose of this document, equipment provided on a train to record data about the operation of its controls and performance in response to those controls and other train control systems.

A data recorder is also referred to elsewhere as a data logger, event recorder, on-train monitoring and recording (OTMR) equipment on-train data recorder (OTDR) and juridical recorder. It may consist of one or more units.

In BS EN 62625-1 the data recorder is referred to as the On Board Driving Data Recording System (ODDRS). This is to differentiate this recorder from other data recorders on the train that are used for maintenance purposes.

Driving cab
The location or position within a train from where a driver may exercise full control over the movement of that train.

Traction unit
Any railway vehicle which has the capacity for self-propulsion (whether or not the power by which it operates is derived from a source external to the vehicle).

Train
Two or more items of rolling stock coupled together, at least one of which is a traction unit, or a single vehicle traction unit not coupled to any other rolling stock, or a single vehicle fitted with a driving cab.

On Board Driving Data Recording System (ODDRS)
The on board system for recording and retaining data with respect to the operation of the train.
References

The Catalogue of Railway Group Standards gives the current issue number and status of documents published by RSSB. This information is also available from www.rgsonline.co.uk.

RGSC 01 Railway Group Standards Code
RGSC 02 The Standards Manual

Documents referenced in the text

Other references


LOC&PAS TSI Locomotives and Passenger Rolling Stock Technical Specification for Interoperability (not yet published)


BS EN 62625-1:2013 Electronic railway equipment - On board driving data recording system - Part 1: System specification