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Part 3: Audio and video recording

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

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IEC TC 9 : ELECTRICAL EQUIPMENT AND SYSTEMS FOR RAILWAYS		
SECRETARIAT: France	SECRETARY: Mr Denis MIGLIANICO	
OF INTEREST TO THE FOLLOWING COMMITTEES:	HORIZONTAL FUNCTION(S):	
ASPECTS CONCERNED:		

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Recipients of this document are invited to submit, with their comments, notification of any local regulations or technical reasons that may exist and should be considered should this proposal proceed, recognizing that failure to address such requirements could result in the need for new or existing "In Some Countries" clauses. (SEE [AC/22/2007](#) OR [NEW GUIDANCE DOC](#)).

TITLE:

Electronic railway equipment – On board driving data recording system – Part 3: Audio and video recording

NOTE FROM TC/SC OFFICERS:

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**ELECTRONIC RAILWAY EQUIPMENT –
ON BOARD DRIVING DATA RECORDING SYSTEM –****Part 3: Audio and video recording****FOREWORD**

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International Standard IEC 62625-3 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

The National Committees are requested to note that for this document the stability date is **20XX**.

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

INTRODUCTION

The international standard parts 1 and 2 of IEC 62625 set common requirements of an On-board Driving Data Recording System (ODDRS) and the conformity testing that can be referred to by the regulations. The purpose of the ODDRS is to record data about the operation of the train. Driving analyses can be carried out to support systematic analysis of incidents and accidents and audit of the driver's ability and qualification to operate the train.

Parts 1 and 2 of IEC 62625 cover the recording of data which mainly consist of signalling events, driver actions and train behaviour. These data support the accident or incident investigation when driver's actions or technical failure of an on-board system could have contributed to the cause. In some cases, though it may be beneficial to the investigation to have an audio and video recording of the situation from driver's perspective as driver mainly uses his sight and hearing senses as a basis for his decisions, and a main cause leading to an accident may have been located outside the vehicle (e.g. an obstacle in the path of the train).

IEC 62625 Part 3 complements Part 1 by adding requirements on audio and video recording in the context of train operation examinations during accident investigations or driving audits on:

- what the driver has said,
- what the driver should have heard, and
- what the driver should have seen.
- what actions the driver was performing at its driver desk

NOTE The modal verb should is used to describe normative behaviour of the driver without absolute certainty as the human sensory processing is not deterministic.

The IEC 62625 Part 3 takes into consideration that (i) some national or regional regulations, labour agreements, etc., may restrict the sound and visual fields allowed for recording, (ii) all sound and visual fields are not required to be recorded.

Requirements and features of the ODDRS specified in this document may alternatively be implemented by other on-board systems, e.g., CCTV, PIS.

ELECTRONIC RAILWAY EQUIPMENT – ON BOARD DRIVING DATA RECORDING SYSTEM –

Part 3: Audio and video recording

1 Scope

This part of IEC 62625 specifies additional requirements to Part 1 of an On-Board Driving Data Recording System for the purpose of recording audio and video in the context to support systematic analysis of incidents, accidents or driving audits. It defines the requirements to capture, to store and to retrieve of audio and visual scenes from within the driver's cab and the front-facing view.

The document is applicable to audio and video recording of:

- Driver's conversations performed via wired fixed train intercom communication devices,
- View of the track from the driver's cab,
- Ambient sound and voices spoken in the driver's cab
- View of the driver's desk.
- View of the driver's cab

This document does not apply to audio and video recording of:

- Passenger areas in the train,
- Passenger entrance to the train,
- On-board technical devices such as pantographs, bogies, doors, etc.
- Other areas for authorized crew members such as conductor compartment, galley, etc.

This document defines the audio and video recording capabilities of the ODDRS (on board driving data recording system) with a certain flexibility level. The value of this capability is defined by the categories of sound and visual fields captured and recorded. This standard does not specify the selection of audio and video sources to perform the above functions.

2 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62625-1 Electronic Railway Equipment - On Board Driving Data Recording System – Part 1: System specification

3 Terms, Definitions, Abbreviations, Acronyms and Conventions

3.1 Terms and Definitions

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

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1.1**Cab or Driver's Cab**

Part of a vehicle used for driving the vehicle or train, forming a separate compartment

[SOURCE : IEC Electropedia]

3.1.2**Active cab**

The unlocked driver's cab from which the driver is currently controlling the train is the active driver's cab

[SOURCE : UIC CODE 612-0].

3.1.3**Audio capture function**

Function consisting of capturing continuously sound samples from the soundscape.

3.1.4**Audio recording function**

Function consisting of transforming an audio flow (non-persistent information) into audio tracks (persistent information).

3.1.5**Audio retrieval function**

Function consisting of providing audio tracks stored on a medium. It can be based on data duplication or a direct extraction of the medium.

3.1.6**Audio analysis function**

Function consisting of playing back audio samples recorded in audio sequences.

3.1.7**Audio flow**

Terms for audio samples of the soundscape captured continuously. The audio flow can be compared with the video flow in terms of abstraction.

3.1.8**Audio sequence**

An audio sequence is a segment of an audio track framed by two time stamps. The audio sequence is similar to the video sequence in terms of abstraction level.

3.1.9**Audio sample**

A short segment of captured sound.

3.1.10**Audio track**

Refer to a specific audio flow recorded in a persistent way on a medium without considering a specific period delimited by 2 absolute date/time bounds. The audio track is compared with the video footage in terms of abstraction level.

3.1.11**Crew**

Authorised crew members aboard the train during the train service operation. For authorized crew members presents during train service operation in the driver's cab, the term "**driver's cab crew**" is used.

3.1.12**Driver's Cab Crew**

Authorised crew members present during train service operation in the driver's cab

3.1.13**Digital Image or Image**

Image consisting of pixels using ranges of discrete values

[SOURCE : IEC 62676]

3.1.14**Image capture function**

Function consisting of taking a snapshot of a scene in the form of a digital image.

3.1.15**Image flow**

Succession of digital images.

3.1.16**Medium or Storage Medium**

Device or set of devices providing the means to store video footage or audio tracks.

3.1.17**Non-persistent**

Antonym of persistent term.

3.1.18**Persistent**

The ability to retain information without the need for (electrical) energy.

3.1.19**Scene**

Area of interest visually covered by the capture function.

3.1.20**Sequence**

Indifferently Audio or video Sequence

3.1.21**Soundscape**

Area of interest audibly covered by audio capture function.

3.1.22**Train Data**

Data defined in clause "4.2.1 Record train data" in IEC 62625 Part 1.

3.1.23**Video capture function**

Function consisting of continuously capturing images of a scene to provide an image flow.

3.1.24**Video footage**

Specific image flow that is being recorded in a persistent way on a storage medium. Typically a video footage is not delimited by 2 absolute date/time bounds in a permanent way but by its capability to store duration.

3.1.25**Video sequence**

The segment of recorded data on a storage medium framed by two time-stamps.

3.1.26**Video recording function**

Transformation of an image flow (non-persistent information) into video footage (persistent information).

3.1.27**Video retrieval function**

Function consisting of providing video sequence from video footage. It can be based on data duplication or a physical extraction of the storage medium from the recording system.

3.1.28**Video analysis function**

Function consisting of displaying a series of images to visually reproduce the captured scenes.

3.1.29**Storage**

Operation or a device ensuring that recorded data is persistently preserved and available for retrieval.

3.1.30**Storage Duration**

Time during which recorded data must be stored in the ODDRS before it can be deleted (overwritten).

[SOURCE: IEC 62676-4]

3.1.31**Conservation**

Action of preventing recorded data from being lost, altered or destroyed outside the operational use of the storage medium, typically during a long storage period without power.

3.1.32**Conservation Duration**

Duration covering the conservation time needed for recorded data

3.1.33**Intercom function / Intercom System**

Function or system implemented in the train in charge of the audio communications between on-board crew members and between on-board crew members and passengers. In the scope of this document, the intercom system only considers the hard-wired train borne communication system.

3.1.34**V-T capability**

Used to designate the ability to provide the images and video sequences of the track from the driver's cab for later analysis.

3.1.35**V-C capability**

Used to designate the ability to provide the images and video sequences of the driver's cab for later analysis.

3.1.36**A-C capability**

Used to designate the ability to provide audio sequences of driver conversations and announcements for subsequent analysis.

3.1.37**A-A capability**

Used to designate the ability to provide audio sequences from the soundscape of the driver's cab for later analysis.

4 Requirements

4.1 Definition of the Capabilities and Related Functions

4.1.1 General

These four video and audio capabilities complement the capabilities of the on-board driving data recording system ODDRS defined in IEC 62625 Part 1 to support systematic analysis of incidents, accidents, and driving audits more effectively (see Figure 1):

- V-T capability:

To capture the view of the track from the driver's cab by providing video footage and images

- V-C capability:

To capture the view of the driver's cab by providing video footage and images

- A-A capability:

To capture the soundscape in the driver's cab by providing audio tracks

- A-C capability:

To capture Conversations and announcements from the driver's cab communication functions by providing audio tracks

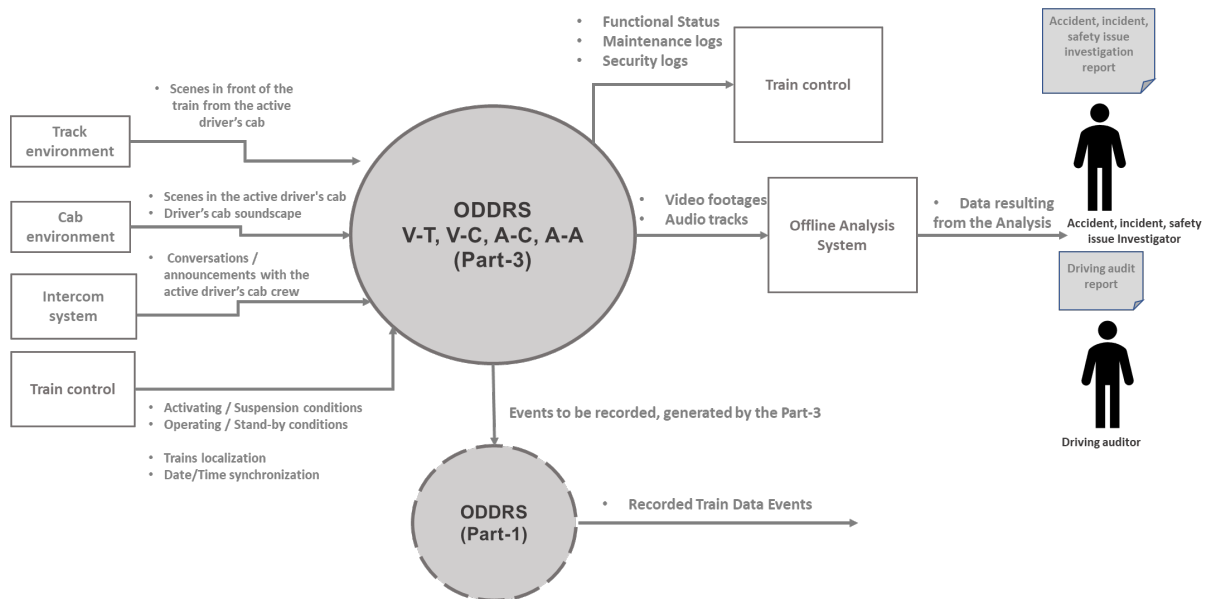
The ODDRS may cover one or more video and audio capabilities.

Where the ODDRS implements video and audio capabilities, the requirements associated with the video and audio capabilities shall be applicable.

NOTE The determination of video and audio capabilities may depend, for example, on the recommendations of the investigative body, national safety authority guidelines, national regulations, and train operating rules. Consequently, the implementation may vary from country to country. For example, one can implement only V-T, a second one V-T and A-A, and a third one all video and audio capabilities V-T, V-C, A-C and A-A.

4.1.2 Context Diagram

The context diagram in Figure 1 summarises the main interactions between the functions of the V-T, V-C, A-A, A-C, capabilities and the other stakeholders (boxes for the systems or main actors presented in the diagram). These stakeholders could be other on-board / wayside systems, or peoples that use the data provided by the ODDRS supporting the IEC 62625 Part 3 functions.



NOTE Each interaction, symbolised by an arrow line, is completed by the list of main information involved in the interactions. The diagram recalls more specifically the interaction with the ODDRS (Part-1) supporting the functions of the IEC 62625 Part 1 (presented as a circle with a dotted line in the diagram).

Figure 1 - Context diagram of ODDRS IEC 62625 Part 3

4.1.3 Data Model

This data model helps to understand the relationships between all the data entities presented in this model, from the “**Train Environnement**” Entity to the final “**Sequence**” entities. The association between entities, their nature and their cardinalities with the support of the short description details the way of a “input entity” is linked to the “output entity”.

Table 1 – Terminology used in the data models

Named Association 1..n	Mean that (1) one entity can associate with (n) multiple entities, but not vice versa. The nature of the association can be indicated on the links.
"is composed of" association	Mean that one entity consists of one or more other entities.
"is captured by" association	Mean that one entity can be captured by one or more entities
"is recorded into" association	Mean that one entity can be recorded into one or more entities
"is stored on"	Mean that one entity can be stored in one or more other entities
"contents" association	Mean that one entity can contain one or more other entities