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Railway applications - Drivers cab - Part 3: Design of displays

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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EN 16186-3

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English Version

Railway applications - Driver's cab - Part 3: Design of displays

Applications ferroviaires - Cabine de conduite - Partie 3 : Conception des affichages

Bahnanwendungen - Führerraum - Teil 3: Gestaltung von Führerraumanzeigen

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European foreword

This document (EN 16186-3:2016) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2017, and conflicting national standards shall be withdrawn at the latest by February 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2008/57/EC [1].

For relationship with EU Directive 2008/57/EC, see informative Annex ZA, which is an integral part of this document.

EN 16186, Railway applications — Driver's cab is written as an EN series on all the aspects to be considered when designing a driver's cab, from anthropometric data and visibility, over the integration of displays, controls and indicators as well as the design of displays to cab layout and access facilities. The background information on the anthropometric data used is provided in CEN/TR 16823 [2].

EN 16186, *Railway applications — Driver’s cab* currently consists of the following parts:

— Part 1: Anthropometric data and visibility;

— Part 2: Integration of displays, controls and indicators;

— Part 3: Design of displays.

NOTE A part 4: "Layout of the driver’s cab" will complete the series.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The requirements of this standard, which interface with vehicle functions, have been elaborated with the commitment to respect the standards specifying these functions and in addition to respect the state of the art of other rolling stock functions.

For tracing of requirements a link to CLC/TS 50459 series [3] or the ERA DMI document [4] serving as a source for the related requirements is added.

The reasons for defining the information are as follows:

— achieving harmonized and coherent presentation of information;

— defining Driver-Machine Interface ergonomics that is compatible with agreed interoperable specifications;

— to reduce the risk of incorrect operation by a driver working with different trains fitted with displays;

— facilitating train operation with unified ergonomics, hence reducing the cost of driver training.

Information designed according to this standard is deemed to fulfil the following basic principles:

— be clear, correct and necessary;

— indicate its priority, whether by positioning, size, colour, sounds, sound levels, etc.;

— minimize confusion of the driver;

— prevent unnecessary distraction of the drivers' attention while performing their normal duties.

If a requirement contains an option, the choice of this option is purely up to the applicant.

NOTE The term “option” is to be understood as a possibility that is usually expressed by the word “can”.

1 Scope

This European Standard specifies all necessary design rules and associated assessment criteria as well as guidance concerning the design of information and the corresponding user interfaces of driver's cabs of EMU, DMU, Railcars, Locomotives and Driving trailers.

NOTE 1 This standard applies to rolling stock in the scope of the Directive 2008/57/EC.

It considers the tasks the driver has to carry out and human factors. This standard specifies how information is arranged and displayed. It is explicitly applicable to display applications like TRD, ETD, CCD and TDD and may be completed by the CLC/TS 50459 series.

This standard is not applicable to legacy ATP systems. If requirements in this standard are in conflict with the ERA DMI document (ERA_ERTMS_015560) the requirements of the ERA DMI document should prevail for the CCD ETCS application.

NOTE 2 For resolving any discrepancies (e.g. 5.4.2.3) ERA is expected to harmonize the usage philosophy of the ERA DMI with this standard.

All assessments based on the normative requirements of this standard are applicable mainly to

— symbols provided by Annex A,

— arrangement of screen areas conform with Figure 1 (generic organization of information),

— colours, fonts,

— audible information.

This standard is applicable to the following aspects:

— legibility and intelligibility of displayed information: general rules concerning the layout of information on the displays, including character size and spacing;

— definition of harmonized colours, symbols, etc.;

— definition of harmonized principles for the command interface (by physical or touchscreen buttons): size, symbols, reaction time, way to give feedback to the driver, etc.;

— general arrangements (dialogue structures, sequences, layout philosophy, colour philosophy), symbols, audible information, data entry arrangements.

NOTE 3 If this standard deals with how information can be given for operation and in degraded situations, it does not define operating rules and degraded situations.

This standard does not request any safety requirement related with displayed information.

This standard specifies minimum requirements and does not prevent more complex solutions.

Requirements describing the functions using the display are out of scope of this standard.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CLC/TS 50459-2, *Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 2: Ergonomic arrangements of GSM-R information*

CLC/TS 50459-3, *Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Driver-Machine Interface - Part 3: Ergonomic arrangements of non ETCS information*

EN 894-2:1997+A1:2008, *Safety of machinery - Ergonomics requirements for the design of displays and control actuators - Part 2: Displays*

prEN 14198:2014, *Railway applications — Braking — Requirements for the brake system of trains for general operation*

EN 16186-1, *Railway applications - Driver's cab - Part 1: Anthropometric data and visibility*

prEN 16186-2:2015, *Railway applications — Driver's cab — Part 2: Integration of displays, controls and indicators*

EN 16334, *Railway applications - Passenger Alarm System - System requirements*

EN 16683:2015, *Railway applications - Call for aid and communication device - Requirements*

EN ISO 9241-307, *Ergonomics of human-system interaction - Part 307: Analysis and compliance test methods for electronic visual displays (ISO 9241-307)*

ISO 2575:2010, *Road vehicles — Symbols for controls, indicators and tell-tales*

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