Irish Standard
I.S. EN 50159:2010&A1:2020

Railway applications - Communication, signalling and processing systems - Safety-related communication in transmission systems

I.S. EN 50159:2010&A1:2020

Incorporating amendments/corrigenda/National Annexes issued since publication:

EN 50159:2010/A1:2020

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National Foreword

I.S. EN 50159:2010&A1:2020 is the adopted Irish version of the European Document EN 50159:2010, Railway applications - Communication, signalling and processing systems - Safety-related communication in transmission systems

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50159:2010/A1

February 2020

ICS 35.240.60; 45.020

English Version

Railway applications - Communication, signalling and processing systems - Safety-related communication in transmission systems

Applications ferroviaires - Systèmes de signalisation, de télécommunication et de traitement - Communication de sécurité sur des systèmes de transmission

Bahnanwendungen - Telekommunikationstechnik, Signaltechnik und Datenverarbeitungssysteme - Sicherheitsrelevante Kommunikation in Übertragungssystemen

This amendment A1 modifies the European Standard EN 50159:2010; it was approved by CENELEC on 2019-07-23. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Ref. No. EN 50159:2010/A1:2020 E

European foreword

This document (EN 50159:2010/A1:2020) has been prepared by CLC/SC 9XA "Communication, signalling and processing systems".

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2020-08-07
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2020-08-07

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

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

1 Replacement of the Annex ZZ

Annex ZZ
(informative)
Relationship between this European standard and the essential requirements of EU Directive 2016/797/EU [2016 OJ L138] aimed to be covered

This European Standard has been prepared under a Commission's standardization request relating to harmonized standards in the field of the Interoperability of the rail system within the European Union, M/483, to provide one voluntary means of conforming to essential requirements of Directive 2016/797/EU of the European Parliament and of the Council of 11 May 2016 on the harmonization of the laws of the Member States relating to the interoperability of the rail system within the European Union [2016 OJ L138].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZ.1 for "Control-Command and Signalling" confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

Table ZZ.1 - Correspondence between this European Standard, the CCS TSI (COMMISSION REGULATION (EU) 2016/919 of 27 May 2016) and Directive 2016/797/EU

Essential Requirements of Directive 2016/797/EU	Chapter / § / points / of CCS TSI	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
1. General Requirements 1.1 Safety 1.1.1 2. Requirements specific to each sub-subsystem 2.3. Control Command and signalling 2.3.1 Safety 2.3.2 Technical compatibility	3.2. Specific Aspects of the Control-Command and Signalling Subsystems 3.2.1. Safety 4.2. Functional and technical specifications of the Subsystems 4.2.1. Control-Command and Signalling safety characteristics relevant to interoperability 4.2.1.1. Safety 6.2. Interoperability constituents 6.2.1. Assessment procedures for Control-Command and Signalling Interoperability Constituents 6.2.3. Assessment requirements 6.3. Control-Command and Signalling Subsystems	Clause 4 Clause 5 Clause 6 Clause 7	The standard EN 50159:2010 is referenced in the CCS TSI (clause 6.2.3). See Annex A, Table A3.

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50159

September 2010

ICS 35.240.60; 45.020

Supersedes EN 50159-1:2001, EN 50159-2:2001

English version

Railway applications - Communication, signalling and processing systems - Safety-related communication in transmission systems

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Bahnanwendungen - Telekommunikationstechnik, Signaltechnik und Datenverarbeitungssysteme - Sicherheitsrelevante Kommunikation in Übertragungssystemen

This European Standard was approved by CENELEC on 2010-09-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

European Committee for Electrotechnical Standardization
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Europäisches Komitee für Elektrotechnische Normung

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Ref. No. EN 50159:2010 E

Foreword

This European Standard was prepared by SC 9XA, Communication, signalling and processing systems, of Technical Committee CENELEC TC 9X, Electrical and electronic applications for railways. It was submitted to the formal vote and was approved by CENELEC as EN 50159 on 2010-09-01.

This document supersedes EN 50159-1:2001 and EN 50159-2:2001.

The contents of both standards have been merged; the informative Annex E gives a mapping between these previous editions and the present document.

This European Standard is closely related to EN 50129:2003.

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

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2011-09-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2013-09-01

This draft European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directives 96/48/EC (HSR), recast by EC Directives 2008/57/EC (RAIL). See Annex ZZ.

Contents

Figures

Tables

Introduction

If a safety-related electronic system involves the transfer of information between different locations, the transmission system then forms an integral part of the safety-related system and it shall be shown that the end to end communication is safe in accordance with EN 50129.

The transmission system considered in this standard, which serves the transfer of information between different locations, has in general no particular preconditions to satisfy. It is from the safety point of view not trusted, or not fully trusted.

The standard is dedicated to the requirements to be taken into account for the communication of safety-related information over such transmission systems.

Although the RAM aspects are not considered in this standard it is recommended to keep in mind that they are a major aspect of the global safety.

The safety requirements depend on the characteristics of the transmission system. In order to reduce the complexity of the approach to demonstrate the safety of the system, transmission systems have been classified into three categories:

– Category 1 consists of systems which are under the control of the designer and fixed during their lifetime;

– Category 2 consists of systems which are partly unknown or not fixed, however unauthorised access can be excluded;

– Category 3 consists of systems which are not under the control of the designer, and where unauthorised access has to be considered.

The first category was covered by EN 50159-1:2001, the others by EN 50159-2:2001.

When safety-related communication systems, which have been approved according to the previous standards, are subject of maintenance and/or extensions, the informative Annex E can be used for traceability purposes of (sub)clauses of this standard with the (sub)clauses of the former series.

1 Scope

This European Standard is applicable to safety-related electronic systems using for digital communication purposes a transmission system which was not necessarily designed for safety-related applications and which is

– under the control of the designer and fixed during the lifetime, or

– partly unknown or not fixed, however unauthorised access can be excluded, or

– not under the control of the designer, and also unauthorised access has to be considered.

Both safety-related equipment and non safety-related equipment can be connected to the transmission system.

This standard gives the basic requirements needed to achieve safety-related communication between safety-related equipment connected to the transmission system.

This European Standard is applicable to the safety requirement specification of the safety-related equipment connected to the transmission system, in order to obtain the allocated safety integrity requirements.

Safety requirements are generally implemented in the safety-related equipment, designed according to EN 50129. In certain cases these requirements may be implemented in other equipment of the transmission system, as long as there is control by safety measures to meet the allocated safety integrity requirements.

The safety requirement specification is a precondition of the safety case of a safety-related electronic system for which the required evidence is defined in EN 50129. Evidence of safety management and quality management has to be taken from EN 50129. The communication-related requirements for evidence of functional and technical safety are the subject of this standard.

This European Standard is not applicable to existing systems, which had already been accepted prior to the release of this standard.

This European Standard does not specify

– the transmission system,

– equipment connected to the transmission system,

– solutions (e.g. for interoperability),

– which kind of data are safety-related and which are not.

A safety-related equipment connected through an open transmission system can be subjected to many different IT security threats, against which an overall program has to be defined, encompassing management, technical and operational aspects.

In this European Standard however, as far as IT security is concerned, only intentional attacks by means of messages to safety-related applications are considered.

This European Standard does not cover general IT security issues and in particular it does not cover IT security issues concerning

– ensuring confidentiality of safety-related information,

– preventing overloading of the transmission system.