

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**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 dans les systèmes de transmission**



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**Applications ferroviaires – Systèmes de signalisation, de télécommunication et
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RAILWAY APPLICATIONS –
COMMUNICATION, SIGNALLING AND PROCESSING SYSTEMS –
SAFETY RELATED COMMUNICATION IN TRANSMISSION SYSTEMS**

FOREWORD

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International Standard IEC 62280 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

This standard is based on EN 50159.

This standard cancels and replaces IEC 62280-1 (2002) and IEC 62280-2 (2002). See Annex E.

The text of this standard is based on the following documents:

FDIS	Report on voting
9/1866A/FDIS	9/1885/RVD

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

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

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

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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, this includes that the end to end communication is safe in accordance with IEC 62425.

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 previously covered by IEC 62280-1:2002, the others by IEC 62280-2:2002.

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

RAILWAY APPLICATIONS – COMMUNICATION, SIGNALLING AND PROCESSING SYSTEMS – SAFETY RELATED COMMUNICATION IN TRANSMISSION SYSTEMS

1 Scope

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

This International 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 IEC 62425. 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 IEC 62425. Evidence of safety management and quality management has to be taken from IEC 62425. The communication related requirements for evidence of functional and technical safety are the subject of this standard.

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

This International 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 International Standard however, as far as IT security is concerned, only intentional attacks by means of messages to safety related applications are considered.

This International 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.

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.

IEC 62278 (all parts), *Railway applications – Specification and demonstration of reliability, availability, maintainability and safety (RAMS)*

IEC 62425:2007, *Railway applications – Communication, signalling and processing systems – Safety related electronic systems for signalling*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

3.1.1

absolute time stamp

time stamp referenced to a global time which is common for a group of entities using a transmission system

3.1.2

access protection

processes designed to prevent unauthorised access to read or to alter information, either within user safety related systems or within the transmission system

3.1.3

additional data

data which is not of any use to the ultimate user processes, but is used for control, availability, and safety purposes

3.1.4

authentic message

message in which information is known to have originated from the stated source

3.1.5

authenticity

state in which information is valid and known to have originated from the stated source

3.1.6

closed transmission system

fixed number or fixed maximum number of participants linked by a transmission system with well known and fixed properties, and where the risk of unauthorised access is considered negligible

3.1.7

communication

transfer of information between applications