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I.S. EN 61907:2010

Communication network dependability engineering (IEC 61907:2009 (EQV))

I.S. EN 61907:2010

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English version

Communication network dependability engineering
(IEC 61907:2009)

Ingénierie de la sûreté de fonctionnement
des réseaux de communication
(CEI 61907:2009)

Zuverlässigkeit
von Kommunikationsnetzen
(IEC 61907:2009)

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CENELEC

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

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

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Foreword

The text of document 56/1339/FDIS, future edition 1 of IEC 61907, prepared by IEC TC 56, Dependability, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61907 on 2010-02-01.

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)	2010-11-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2013-02-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61907:2009 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

[1]	IEC 60300-1	NOTE	Harmonized as EN 60300-1.
[2]	IEC 60300-2	NOTE	Harmonized as EN 60300-2.
[3]	IEC 60300-3-1	NOTE	Harmonized as EN 60300-3-1.
[4]	IEC 60300-3-3	NOTE	Harmonized as EN 60300-3-3.
[5]	IEC 60300-3-11	NOTE	Harmonized as EN 60300-3-11.
[6]	IEC 60300-3-12	NOTE	Harmonized as EN 60300-3-12.
[7]	IEC 60812	NOTE	Harmonized as EN 60812.
[8]	IEC 61025	NOTE	Harmonized as EN 61025.
[9]	IEC 61078	NOTE	Harmonized as EN 61078.
[10]	IEC 61165	NOTE	Harmonized as EN 61165.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60050-191	-	International Electrotechnical Vocabulary (IEV) - Chapter 191: Dependability and quality of service	-	-
IEC 60300-3-15	-	Dependability management - Part 3-15: Application guide - Engineering of system dependability	EN 60300-3-15	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMUNICATION NETWORK DEPENDABILITY ENGINEERING

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61907 has been prepared by IEC technical committee 56: Dependability.

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

FDIS	Report on voting
56/1339/FDIS	56/1350/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 maintenance result 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

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

INTRODUCTION

Communication networks are today growing in complexity to meet diverse market demands and public communication needs; networks such as mobile phones, e-commerce, intranet and Internet services.

At the same time, communication technologies are developing rapidly to provide efficient network services and dependable performance needed in worldwide communications. The essential communication services such as information exchange, data processing and network connections enable public and private communications work to be carried out cost-effectively. Business and private sectors greatly depend on these communication services that have become pivotal in their daily routines. A key factor in ensuring network performance and network service functions is dependability.

Network dependability is the ability of a network to perform as and when required and to meet users' communication needs for continuous network performance and service operation. From a user's perspective, dependability infers that the provision of network service functions is trustworthy and capable of performing the desirable service upon demand. Network dependability is characterized by its performance attributes including availability of network performance and quality of service.

The network concept is an extension of the systems concept, addressing a common framework for the interaction of network elements and interoperability of service functions that together achieve specific communication objectives.

The network requires specific performance characteristics in order to deliver both its service functions and communication services. Network dependability engineering is a specific risk-based technical discipline intended to deal with the diverse applications and deployment of essential communication services. Unlike the system life cycle where system retirement exists, a network seldom reaches retirement. A network evolves with time to accommodate innovative feature applications and provision of continual communication service needs. The network life cycle is evolutionary and has to address technology convergence issues and renewal processes as well as characterize specific dependability attributes to meet network performance objectives. The need for network dependability standardization is essential to achieve cost-effective development and implementation of communication networks.

Communication network dependability provides important performance attributes for network equipment developers and suppliers, network integrators and providers of network service functions who are mainly concerned with global competitive environments. The primary reason is that dependability can seriously impact revenue generation and affect return-on-investments. Users of network service functions and communication services rely heavily on network functions and reliable services that guarantee network security and uninterrupted network connections for voice, video and data transmission.

This International Standard provides a generic framework for communication network dependability. The communication network includes telecommunications networks, Internet and intra-networks utilizing information technology. This standard describes the influence of dependability attributes and their impact on network performance. It provides the criteria and methodology for network technology designs, security service functions, dependability assessment and quality of service evaluation. This is to guide engineering and implementation processes for realization of network dependability performance objectives.

This standard constitutes part of a framework of standards on system aspects of dependability by extending the system dependability concepts of IEC 60300-3-15 for network applications, and to support IEC 60300-1 and IEC 60300-2 on dependability management. The network performance and communication services in this standard are referenced in the International Telecommunication Union Telecommunication standardization sector (ITU-T) series of recommendations.

COMMUNICATION NETWORK DEPENDABILITY ENGINEERING

1 Scope

This International Standard gives guidance on dependability engineering of communication networks. It establishes a generic framework for network dependability performance, provides a process for network dependability implementation, and presents criteria and methodology for network technology designs, performance evaluation, security consideration and quality of service measurement to achieve network dependability performance objectives.

This standard is applicable to network equipment developers and suppliers, network integrators and providers of network service functions for planning, evaluation and implementation of network dependability.

2 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-191, *International Electrotechnical Vocabulary – Chapter 191: Dependability and quality of service*

IEC 60300-3-15, *Dependability management – Part 3-15: Application guide – Engineering of system dependability*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-191 and the following apply.

3.1.1
communication network
system of communication nodes and links that provides transmission of analog or digital signals

EXAMPLES Telecommunications networks, Internet, intranet, extranet, Wide Area Networks (WAN), Local Area Networks (LAN) and computer networking utilizing information technology.

NOTE 1 A network has its boundary. All nodes at the network boundary are called ends. In some applications, the term “node” is used instead of “end” as a communication access point to the network, as well as for interconnections between the transmission links.

NOTE 2 A “backbone” communication network consists of core network and high-speed transmission lines (national or international), connecting between major switching network nodes (interconnection of transmission lines) at various locations in a country or region.

3.1.2
(network) dependability
ability to perform as and when required to meet specified communication and operational requirements