

**Dependability management - Part 3-1: Application
guide - Analysis techniques for dependability -
Guide on methodology**

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 60300-3-1:2004 sisaldab Euroopa standardi EN 60300-3-1:2004 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 16.11.2004 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

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This Estonian standard EVS-EN 60300-3-1:2004 consists of the English text of the European standard EN 60300-3-1:2004.

This standard is ratified with the order of Estonian Centre for Standardisation dated 16.11.2004 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

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**Dependability management
Part 3-1: Application guide –
Analysis techniques for dependability –
Guide on methodology
(IEC 60300-3-1:2003)**

Gestion de la sûreté de fonctionnement
Partie 3-1: Guide d'application –
Techniques d'analyse de la sûreté
de fonctionnement –
Guide méthodologique
(CEI 60300-3-1:2003)

Zuverlässigkeitsmanagement
Teil 3-1: Anwendungsleitfaden –
Verfahren zur Analyse der Zuverlässigkeit –
Leitfaden zur Methodik
(IEC 60300-3-1:2003)

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CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of the International Standard IEC 60300-3-1:2003, prepared by IEC TC 56, Dependability, was submitted to the formal vote and was approved by CENELEC as EN 60300-3-1 on 2004-09-01.

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) | 2005-09-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2007-09-01 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60300-3-1:2003 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60300-2	NOTE	Harmonized as EN 60300-2:1996 (not modified).
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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 Where an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-191	1990	International Electrotechnical Vocabulary (IEV) Chapter 191: Dependability and quality of service	-	-
IEC 60300-3-2	1993	Dependability management Part 3: Application guide – Section 2: Collection of dependability data from the field	-	-
IEC 60300-3-4	1996	Part 3: Application guide – Section 4: Guide to the specification of dependability requirements	-	-
IEC 60300-3-5	2001	Part 3-5: Application guide - Reliability test conditions and statistical test principles	-	-
IEC 60300-3-10	2001	Part 3-10: Application guide - Maintainability	-	-
IEC 60706-1	1982	Guide on maintainability of equipment Part 1 - Sections 1, 2 and 3: Introduction, requirements and maintainability programme	-	-
IEC 60706-2	1990	Part 2 - Section 5: Maintainability studies during the design phase	-	-
IEC 60812	1985	Analysis techniques for system reliability - Procedure for failure mode and effects analysis (FMEA)	HD 485 S1	1987
IEC 61078	1991	Analysis techniques for dependability - Reliability block diagram method	EN 61078	1993
IEC 61165	1995	Application of Markov techniques	-	-
IEC 61709	1996	Electronic components - Reliability - Reference conditions for failure rates and stress models for conversion	EN 61709	1998

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61882	2001	Hazard and operability studies (HAZOP studies) - Application guide	-	-
ISO 9000	2000	Quality management systems - Fundamentals and vocabulary	EN ISO 9000	2000

INTERNATIONAL STANDARD

IEC
60300-3-1

Second edition
2003-01

Dependability management –

Part 3-1: Application guide – Analysis techniques for dependability – Guide on methodology

Gestion de la sûreté de fonctionnement –

*Partie 3-1:
Guide d'application –
Techniques d'analyse de la sûreté de fonctionnement –
Guide méthodologique*



Reference number
IEC 60300-3-1:2003(E)

Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

Consolidated editions

The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

DEPENDABILITY MANAGEMENT –**Part 3-1: Application guide –
Analysis techniques for dependability – Guide on methodology**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 60300-3-1 has been prepared by IEC technical committee 56: Dependability.

This second edition cancels and replaces the first edition, published in 1991, and constitutes a full technical revision. In particular, the guidance on the selection of analysis techniques and the number of analysis techniques covered has been extended.

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

FDIS	Report on voting
56/825/FDIS	56/840/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 2007. At this date, the publication will be

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

INTRODUCTION

The analysis techniques described in this part of IEC 60300 are used for the prediction, review and improvement of reliability, availability and maintainability of an item.

These analyses are conducted during the concept and definition phase, the design and development phase and the operation and maintenance phase, at various system levels and degrees of detail, in order to evaluate, determine and improve the dependability measures of an item. They can also be used to compare the results of the analysis with specified requirements.

In addition, they are used in logistics and maintenance planning to estimate frequency of maintenance and part replacement. These estimates often determine major life cycle cost elements and should be carefully applied in life cycle cost and comparative studies.

In order to deliver meaningful results, the analysis should consider all possible contributions to the dependability of a system: hardware, software, as well as human factors and organizational aspects.

DEPENDABILITY MANAGEMENT –

Part 3-1: Application guide – Analysis techniques for dependability – Guide on methodology

1 Scope

This part of IEC 60300 gives a general overview of commonly used dependability analysis techniques. It describes the usual methodologies, their advantages and disadvantages, data input and other conditions for using various techniques.

This standard is an introduction to selected methodologies and is intended to provide the necessary information for choosing the most appropriate analysis methods.

2 Normative references

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.

IEC 60050(191):1990, *International Electrotechnical Vocabulary (IEV) – Chapter 191: Dependability and quality of service*

IEC 60300-3-2:1993, *Dependability management – Part 3: Application guide – Section 2: Collection of dependability data from the field*

IEC 60300-3-4:1996, *Dependability management – Part 3: Application guide – Section 4: Guide to the specification of dependability requirements*

IEC 60300-3-5:2001, *Dependability management – Part 3-5: Application guide – Reliability test conditions and statistical test principles*

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IEC 60706-1:1982, *Guide on maintainability of equipment – Part 1: Sections One, Two and Three – Introduction, requirements and maintainability programme*

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