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Funktionssäkerhet hos utrustning – Metoder för bedömning av funktionssäkerhet

*Equipment reliability –
Reliability assessment methods*

Som svensk standard gäller europastandarden EN 62308:2006. Den svenska standarden innehåller den officiella engelska språkversionen av EN 62308:2006.

Nationellt förord

Europastandarden EN 62308:2006

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 62308, First edition, 2006 - Equipment reliability - Reliability assessment methods**

utarbetad inom International Electrotechnical Commission, IEC.

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Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

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SEK Svensk Elstandard

Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

English version

**Equipment reliability -
Reliability assessment methods
(IEC 62308:2006)**

Fiabilité de l'équipement -
Méthodes d'évaluation de la fiabilité
(CEI 62308:2006)

Zuverlässigkeit von Geräten -
Verfahren zur Zuverlässigkeitsbewertung
(IEC 62308:2006)

This European Standard was approved by CENELEC on 2006-11-01. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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 document 56/1110/FDIS, future edition 1 of IEC 62308, prepared by IEC TC 56, Dependability, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62308 on 2006-11-01.

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) 2007-08-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2009-11-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62308:2006 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 61751 NOTE Harmonized as EN 61751:1998 (not modified).

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.

<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 60300-1	- ¹⁾	Dependability management Part 1: Dependability management systems	EN 60300-1	2003 ²⁾
IEC 60300-3-1	2003	Dependability management Part 3-1: Application guide - Analysis techniques for dependability - Guide on methodology	EN 60300-3-1	2004
IEC 60300-3-2	- ¹⁾	Dependability management Part 3-2: Application guide - Collection of dependability data from the field	EN 60300-3-2	2005 ²⁾
IEC 60300-3-3	- ¹⁾	Dependability management Part 3-3: Application guide - Life cycle costing	EN 60300-3-3	2004 ²⁾
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	-	-
IEC 60300-3-9	- ¹⁾	Dependability management Part 3: Application guide - Section 9: Risk analysis of technological systems	-	-
IEC 60300-3-11	- ¹⁾	Dependability management Part 3-11: Application guide - Reliability centred maintenance	-	-
IEC 60300-3-12	- ¹⁾	Dependability management Part 3-12: Application guide - Integrated logistic support	EN 60300-3-12	2004 ²⁾
IEC 60812	- ¹⁾	Analysis techniques for system reliability - Procedure for failure mode and effects analysis (FMEA)	EN 60812	2006 ²⁾

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61025	- ¹⁾	Fault tree analysis (FTA)	HD 617 S1	1992 ²⁾
IEC 61078	- ¹⁾	Analysis techniques for dependability - Reliability block diagram and Boolean methods	EN 61078	2006 ²⁾
IEC 61160	- ¹⁾	Design review	EN 61160	2005 ²⁾
IEC 61165	- ¹⁾	Application of Markov techniques	EN 61165	2006 ²⁾
IEC 61508	Series	Functional safety of electrical/electronic/programmable electronic safety-related systems	EN 61508	Series
IEC 61649	- ¹⁾	Goodness-of-fit tests, confidence intervals and lower confidence limits for Weibull distributed data	-	-
IEC 61709	- ¹⁾	Electronic components - Reliability - Reference conditions for failure rates and stress models for conversion	EN 61709	1998 ²⁾
IEC 61710	- ¹⁾	Power law model - Goodness-of-fit tests and estimation methods	-	-
IEC 61713	- ¹⁾	Software dependability through the software life-cycle processes - Application guide	-	-
IEC 61882	- ¹⁾	Hazard and operability studies (HAZOP studies) - Application guide	-	-
IEC/TR 62380	- ¹⁾	Reliability data handbook - Universal model for reliability prediction of electronics components, PCBs and equipment	-	-

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EQUIPMENT RELIABILITY – RELIABILITY ASSESSMENT METHODS

1 Scope

This International Standard describes early reliability assessment methods for items based on field data and test data for components and modules. It is applicable to mission, safety and business critical, high integrity and complex items. It contains information on why early reliability estimates are required and how and where the assessment would be used. Finally, it details methods for reliability assessment and the data required to support the assessment. To estimate durability (life time or wear-out), the physics-of-failure method is used.

Three types of assessment are discussed in detail:

- the similarity approach;
- models for durability analysis;
- handbook methods.

Clause 6 provides an introduction to reliability assessment and Clause 7 the management of the process. Clause 8 describes the data needs, sources and types for assessments and Clause 9 provides details of the assessment methods.

Annexes A and B provide additional information to aid understanding of the similarity analysis and durability analysis.

This standard is applicable to making reliability estimates for specifications, design, design modification and support engineering.

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 – Chapter 191: Dependability and quality of service*

IEC 60300-1, *Dependability management – Part 1: Dependability management systems*

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

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

IEC 60300-3-3, *Dependability management – Part 3-3: Application guide – Life cycle costing*

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