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NORME INTERNATIONALE

Dependability management – Part 3-15: Application guide – Engineering of system dependability

Gestion de la sûreté de fonctionnement – Partie 3-15: Guide d'application – Ingénierie de la sûreté de fonctionnement des systèmes

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FOREWORD

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International Standard IEC 60300-3-15 has been prepared by IEC technical committee 56: Dependability.

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

FDIS	Report on voting
56/1315/FDIS	56/1321/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.

A list of all parts of the IEC 60300 series, under the general title *Dependability management*, can be found on the IEC website.

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- withdrawn,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

Systems are growing in complexity in today's application environments. System dependability has become an important performance attribute that affects the business strategies in system acquisition and the cost-effectiveness in system ownership and operations. The overall dependability of a system is the combined result of complex interactions of system elements, application environments, human-machine interfaces, deployment of support services and other influencing factors.

This part of IEC 60300 gives guidance on the engineering of the overall system to achieve its dependability objectives. The engineering approach in this standard represents the application of appropriate scientific knowledge and relevant technical disciplines for realizing the required dependability for the system of interest.

The four main aspects for engineering dependability concerning systems are addressed in terms of

– process,
– achievement,
– assessment, and
– measurement.

The engineering disciplines consist of technical processes that are applicable to the various stages of the system life cycle. Specific technical processes described in this part of IEC 60300 are supported by a sequence of relevant process activities to achieve the objectives of each system life cycle stage.

This part of IEC 60300 is applicable to generic systems with interacting system functions consisting of hardware, software and human elements to achieve system performance objectives. In many cases a function can be realized by commercial off-the-shelf products. A system can link to other systems to form a network. The boundaries separating a product from a system, and a system from a network, can be distinguished by defining the application of the entity. For example, a digital timer as a product can be used to synchronize the operation of a computer; the computer as a system can be linked with other computers in a business office for communications as a local area network. The application environment is applicable to all kinds of systems. Examples of applicable systems include control systems for power generation, fault-tolerant computing systems and systems for provision of maintenance support services.

Guidance on dependability engineering is provided for generic systems. It does not classify systems for special applications. The majority of systems in use are generally repairable throughout their life cycle operation for economic reasons and practical applications. Non-repairable systems such as communication satellites, remote sensing/monitoring equipment, and one-shot devices are considered as application-specific systems. They require further identification of specific application environment, operational conditions and additional information on unique performance characteristics to achieve their mission success objectives. Non-repairable subsystems and components are considered as throwaway items. The selection of applicable processes for engineering dependability into a specific system is carried out through the project tailoring and dependability management process.

This part of IEC 60300 forms part of the framework standards on system aspects of dependability to support IEC 60300-1 and IEC 60300-2 on dependability management. References are made to project management activities applicable to systems. They include identification of dependability elements and tasks relevant to the system and guidelines for dependability management reviews and tailoring of dependability projects.

DEPENDABILITY MANAGEMENT –

Part 3-15: Application guide – Engineering of system dependability

1 Scope

This part of IEC 60300 provides guidance for an engineering system's dependability and describes a process for realization of system dependability through the system life cycle.

This standard is applicable to new system development and for enhancement of existing systems involving interactions of system functions consisting of hardware, software and human elements.

This standard also applies to providers of subsystems and suppliers of products that seek system information and criteria for system integration. Methods and tools are provided for system dependability assessment and verification of results for achievement of dependability objectives.

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

IEC 60300-2, *Dependability management – Part 2: Guidelines for dependability management*

3 Terms and definitions

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

3.1
system
set of interrelated items considered as a whole for a defined purpose, separated from other items

NOTE 1 A system is generally defined with the view of performing a definite function.

NOTE 2 The system is considered to be bound by an imaginary surface that intersects the links between the system and the environment and the other external systems.

NOTE 3 External resources (i.e. outside the system boundary) may be required for the system to operate.

NOTE 4 A system structure may be hierarchical, e.g. system, subsystem, component, etc.

3.2
subsystem
system that is part of a more complex system

3.3
operating profile
complete set of tasks to achieve a specific system objective