SLOVENSKI STANDARD
SIST EN 60300-3-3:2007

01-januar-2007

Upravljanje zagotovljivosti - 3-3. del: Vodilo za uporabo - Izračun stroškov v življenjskem ciklu (IEC 60300-3-3:2004)

Dependability management -- Part 3-3: Application guide - Life cycle costing

Zuverlässigkeitsmanagement -- Teil 3-3: Anwendungsleitfaden - Lebenszykluskosten

Gestion de la sûreté de fonctionnement -- Partie 3-3: Guide d'application - Evaluation du coût de vie

Ta slovenski standard je istoveten z: **EN 60300-3-3:2004**

ICS:

03.120.01	Kakovost na splošno	Quality in general
21.020	Značilnosti in načrtovanje strojev, aparatov, opreme	Characteristics and design of machines, apparatus, equipment

SIST EN 60300-3-3:2007 **en**

EUROPEAN STANDARD **EN 60300-3-3**

NORME EUROPÉENNE

EUROPÄISCHE NORM September 2004

ICS 21.020

English version

Dependability management
Part 3-3: Application guide – Life cycle costing
(IEC 60300-3-3:2004)

Gestion de la sûreté de fonctionnement
Partie 3-3: Guide d'application -
Evaluation du coût de vie
(CEI 60300-3-3:2004)

Zuverlässigkeitsmanagement
Teil 3-3: Anwendungsleitfaden -
Lebenszykluskosten
(IEC 60300-3-3:2004)

This European Standard was approved by CENELEC on 2004-09-01. 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, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and 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

Ref. No. EN 60300-3-3:2004 E

Foreword

The text of document 56/942/FDIS, future edition 2 of IEC 60300-3-3, prepared by IEC TC 56, Dependability, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60300-3-3 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)	2005-06-01
– 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 60300-3-3:2004 was approved by CENELEC as a European Standard without any modification.

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.

Publication	Year	Title	EN/HD	Year
IEC 60050-191	1990	International Electrotechnical Vocabulary (IEV) Chapter 191: Dependability and quality of service	-	-
IEC 60300-3-12	- [1)]	Dependability management Part 3-12: Application guide - Integrated logistic support	EN 60300-3-12	2004 [2)]
IEC 61703	- [1)]	Mathematical expressions for reliability, availability, maintainability and maintenance support terms	EN 61703	2002 [2)]
IEC 62198	- [1)]	Project risk management - Application guidelines	-	-

1) Undated reference.

2) Valid edition at date of issue.

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
60300-3-3

Deuxième édition
Second edition
2004-07

Gestion de la sûreté de fonctionnement –

Partie 3-3:
Guide d'application –
Evaluation du coût du cycle de vie

Dependability management –

Part 3-3:
Application guide –
Life cycle costing

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch

Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE XB

Pour prix, voir catalogue en vigueur
For price, see current catalogue

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

DEPENDABILITY MANAGEMENT –

Part 3-3: Application guide – Life cycle costing

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.

2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.

3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.

4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.

5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.

6) All users should ensure that they have the latest edition of this publication.

7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.

8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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

This second edition cancels and replaces the first edition published in 1996, and constitutes a full technical revision.

This edition expands upon the technical guidance in response to requests from practitioners. The examples in particular have been enhanced.

The bilingual version (2005-08) replaces the English version.

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

FDIS	Report on voting
56/942/FDIS	56/962/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.

IEC 60300 consists of the following parts, under the general title *Dependability management:*

Part 1: Dependability management systems

Part 2: Dependability programme elements and tasks

Part 3: Application guide

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

Products today are required to be reliable. They have to perform their functions safely with no undue impact on the environment and be easily maintainable throughout their useful lives. The decision to purchase is not only influenced by the product's initial cost (acquisition cost) but also by the product's expected operating and maintenance cost over its life (ownership cost) and disposal cost. In order to achieve customer satisfaction, the challenge for suppliers is to design products that meet requirements and are reliable and cost competitive by optimizing acquisition, ownership and disposal costs. This optimization process should ideally start at the product's inception and should be expanded to take into account all the costs that will be incurred throughout its lifetime. All decisions made concerning a product's design and manufacture may affect its performance, safety, reliability, maintainability, maintenance support requirements, etc., and ultimately determine its price and ownership and disposal costs.

Life cycle costing is the process of economic analysis to assess the total cost of acquisition, ownership and disposal of a product. This analysis provides important inputs in the decision-making process in the product design, development, use and disposal. Product suppliers can optimize their designs by evaluation of alternatives and by performing trade-off studies. They can evaluate various operating, maintenance and disposal strategies (to assist product users) to optimize life cycle cost (LCC). Life cycle costing can also be effectively applied to evaluate the costs associated with a specific activity, for example, the effects of different maintenance concepts/approaches, to cover a specific part of a product, or to cover only selected phase or phases of a product’s life cycle.

Life cycle costing is most effectively applied in the product’s early design phase to optimize the basic design approach. However, it should also be updated and used during the subsequent phases of the life cycle to identify areas of significant cost uncertainty and risk.

The necessity for formal application of the life cycle costing process to a product will normally depend on contractual requirements. However, life cycle costing provides a useful input to any design decision-making process. Therefore, it should be integrated with the design process, to the extent feasible, to optimize product characteristics and costs.

DEPENDABILITY MANAGEMENT –

Part 3-3: Application guide – Life cycle costing

1 Scope

This part of IEC 60300 provides a general introduction to the concept of life cycle costing and covers all applications. Although the life cycle costs consist of many contributing elements, this standard particularly highlights the costs associated with dependability of the product.

This standard is intended for general application by both customers (users) and suppliers of products. It explains the purpose and value of life cycle costing and outlines the general approaches involved. It also identifies typical life cycle cost elements to facilitate project and programme planning.

General guidance is provided for conducting a life cycle cost analysis, including life cycle cost model development. Illustrative examples are provided to explain the concepts.

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 60300-3-12, *Dependability management – Part 3-12: Application guide – Integrated logistic support*

IEC 61703, *Mathematical expressions for reliability, maintainability and maintenance support terms*

IEC 62198, *Project risk management – Application guidelines*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-191 and IEC 61703, together with the following definitions, apply.

3.1
life cycle
time interval between a product's conception and its disposal

3.2
life cycle costing
process of economic analysis to assess the life cycle cost of a product over its life cycle or a portion thereof

3.3
life cycle cost
LCC
cumulative cost of a product over its life cycle

3.4
base date
fixed point in time set as the common cost reference

4 Life cycle costing

4.1 Objectives of life cycle costing

Life cycle costing is the process of economic analysis to assess the total cost of acquisition, ownership and disposal of a product. It can be applied to the whole life cycle of a product or to parts or combinations of different life cycle phases.

The primary objective of life cycle costing is to provide input to decision making in any or all phases of a product's life cycle.

An important objective in the preparation of LCC models is to identify costs that may have a major impact on the LCC or may be of special interest for that specific application. Equally important is to identify costs that may only influence the LCC to a very small extent.

The more common types of decisions to which the life cycle costing process provides input include, for example:

– evaluation and comparison of alternative design approaches and disposal options technologies;
– assessment of economic viability of projects/products;
– identification of cost contributors and cost effective improvements;
– evaluation and comparison of alternative strategies for product use, operation, test, inspection, maintenance, etc.;
– evaluation and comparison of different approaches for replacement, rehabilitation/life extension or retirement of ageing facilities;
– allocation of available funds among the competing priorities for product development/ improvement;
– assessment of product assurance criteria through verification tests and its trade-off;
– long-term financial planning.

Life cycle costing can be used to provide input to integrated logistic support analysis. See IEC 60300-3-12 for detailed information on integrated logistic support analysis.

4.2 Product life cycle phases and LCC

Fundamental to the concept of life cycle costing is a basic understanding of a product life cycle and the activities that are performed during these phases. Also essential is an understanding of the relationship of these activities to the product performance, safety, reliability, maintainability and other characteristics contributing to life cycle costs.

There are six major life cycle phases of a product as follows:

a) concept and definition;

b) design and development;

c) manufacturing;

d) installation;

e) operation and maintenance;

f) disposal.

The appropriate life cycle phases, or parts or combinations of these phases, should be selected to suit the special needs of each specific analysis. In a general way, the total costs incurred during the above phases can also be divided into acquisition cost, ownership cost and disposal cost.

$$LCC = Cost_{acquisition} + Cost_{ownership} + Cost_{disposal}$$

Acquisition costs are generally visible, and can be readily evaluated before the acquisition decision is made and may or may not include installation cost.

The ownership costs, which are often a major component of LCC, in many cases, exceed acquisition costs and are not readily visible. These costs are difficult to predict and may also include the cost associated with installation.

Disposal costs may represent a significant proportion of total LCC. Legislation may require activities during the disposal phase that for major projects, e.g. nuclear power stations, involve a significant expenditure.

Figure 1 shows the life cycle phases of a product, together with some of the topics that should be addressed by a life cycle costing study.