SLOVENSKI STANDARD

SIST EN 61511-1:2007

januar 2007

Funkcijska varnost - Sistemi z varnostnimi instrumenti za sektor procesne industrije - 1. del: Okvirno, definicije, sistem, zahteve za strojno in programsko opremo (IEC 61511-1:2003 + popravek 2004)

(istoveten EN 61511-1:2004)

Functional safety - Safety instrumented systems for the process industry sector - Part 1: Framework, definitions, system, hardware and software requirements (IEC 61511-1:2003 + corrigendum 2004)

ICS 25.040.40

Referenčna številka
SIST EN 61511-1:2007(en)

EUROPEAN STANDARD **EN 61511-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM December 2004

ICS 13.110; 25.040.01

English version

Functional safety – Safety instrumented systems for the process industry sector Part 1: Framework, definitions, system, hardware and software requirements

(IEC 61511-1:2003 + corrigendum 2004)

Sécurité fonctionnelle – Systèmes instrumentés de sécurité pour le secteur des industries de transformation Partie 1: Cadre, définitions, exigences pour le système, le matériel et le logiciel (CEI 61511-1:2003 + corrigendum 2004)

Funktionale Sicherheit - Sicherheitstechnische Systeme für die Prozessindustrie Teil 1: Allgemeines, Begriffe, Anforderungen an Systeme, Software und Hardware (IEC 61511-1:2003 + Corrigendum 2004)

This European Standard was approved by CENELEC on 2004-10-01. 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 61511-1:2004 E

Foreword

The text of the International Standard IEC 61511-1:2003, prepared by SC 65A, System aspects, of IEC TC 65, Industrial-process measurement and control, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 61511-1 on 2004-10-01 without any modification.

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) 2005-10-01

– latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2007-10-01

Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 61511-1:2003 + corrigendum November 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 60654-1	1993	Industrial-process measurement and control equipment - Operating conditions Part 1: Climatic conditions	EN 60654-1	1993
IEC 60654-3	1983	Part 3: Mechanical influences	EN 60654-3	1997
IEC 61326	- [1)]	Electrical equipment for measurement, control and laboratory use - EMC requirements	EN 61326	1997 [2)]
IEC 61508-2	- [1)]	Functional safety of electrical/electronic/programmable electronic safety-related systems Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems	EN 61508-2	2001 [2)]
IEC 61508-3	- [1)]	Part 3: Software requirements	EN 61508-3	2001 [2)]
IEC 61511-2	- [1)]	Functional safety - Safety instrumented systems for the process industry sector Part 2: Guidelines for the application of IEC 61511-1	EN 61511-2	2004 [2)]

1) Undated reference.

2) Valid edition at date of issue.

NORME INTERNATIONALE
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61511-1

Première édition
First edition
2003-01

Sécurité fonctionnelle – Systèmes instrumentés de sécurité pour le secteur des industries de transformation –

Partie 1: Cadre, définitions, exigences pour le système, le matériel et le logiciel

Functional safety – Safety instrumented systems for the process industry sector –

Part 1: Framework, definitions, system, hardware and software requirements

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International Electrotechnical Commission
Международная Электротехническая Комиссия

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FUNCTIONAL SAFETY –
SAFETY INSTRUMENTED SYSTEMS
FOR THE PROCESS INDUSTRY SECTOR –

Part 1: Framework, definitions, system, hardware and software requirements

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 61511-1 has been prepared by subcommittee 65A: System aspects, of IEC technical committee 65: Industrial-process measurement and control.

This bilingual version (2003-12) replaces the English version.

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

FDIS	Report on voting
65A/368/FDIS	65A/372/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.

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

IEC 61511 consists of the following parts, under the general title *Functional safety: Safety instrumented systems for the process industry sector* (see Figure 1):

Part 1: Framework, definitions, system, hardware and software requirements

Part 2: Guidelines in the application of IEC 61511-1

Part 3: Guidance for the determination of the required safety integrity levels

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.

The contents of the corrigendum of November 2004 have been included in this copy.

INTRODUCTION

Safety instrumented systems have been used for many years to perform safety instrumented functions in the process industries. If instrumentation is to be effectively used for safety instrumented functions, it is essential that this instrumentation achieves certain minimum standards and performance levels.

This standard addresses the application of safety instrumented systems for the process industries. It also requires a process hazard and risk assessment to be carried out to enable the specification for safety instrumented systems to be derived. Other safety systems are only considered so that their contribution can be taken into account when considering the performance requirements for the safety instrumented systems. The safety instrumented system includes all components and subsystems necessary to carry out the safety instrumented function from sensor(s) to final element(s).

This standard has two concepts which are fundamental to its application; safety lifecycle and safety integrity levels.

This standard addresses safety instrumented systems which are based on the use of electrical/electronic/programmable electronic technology. Where other technologies are used for logic solvers, the basic principles of this standard should be applied. This standard also addresses the safety instrumented system sensors and final elements regardless of the technology used. This standard is process industry specific within the framework of IEC 61508 (see Annex A).

This standard sets out an approach for safety life-cycle activities to achieve these minimum standards. This approach has been adopted in order that a rational and consistent technical policy is used.

In most situations, safety is best achieved by an inherently safe process design. If necessary, this may be combined with a protective system or systems to address any residual identified risk. Protective systems can rely on different technologies (chemical, mechanical, hydraulic, pneumatic, electrical, electronic, programmable electronic). To facilitate this approach, this standard

- requires that a hazard and risk assessment is carried out to identify the overall safety requirements;
- requires that an allocation of the safety requirements to the safety instrumented system(s) is carried out;
- works within a framework which is applicable to all instrumented methods of achieving functional safety;
- details the use of certain activities, such as safety management, which may be applicable to all methods of achieving functional safety.

This standard on safety instrumented systems for the process industry

- addresses all safety life-cycle phases from initial concept, design, implementation, operation and maintenance through to decommissioning;
- enables existing or new country specific process industry standards to be harmonized with this standard.

This International Standard is intended to lead to a high level of consistency (for example, of underlying principles, terminology, information) within the process industries. This should have both safety and economic benefits.

In jurisdictions where the governing authorities (for example, national, federal, state, province, county, city) have established process safety design, process safety management, or other requirements, these take precedence over the requirements defined in this standard.

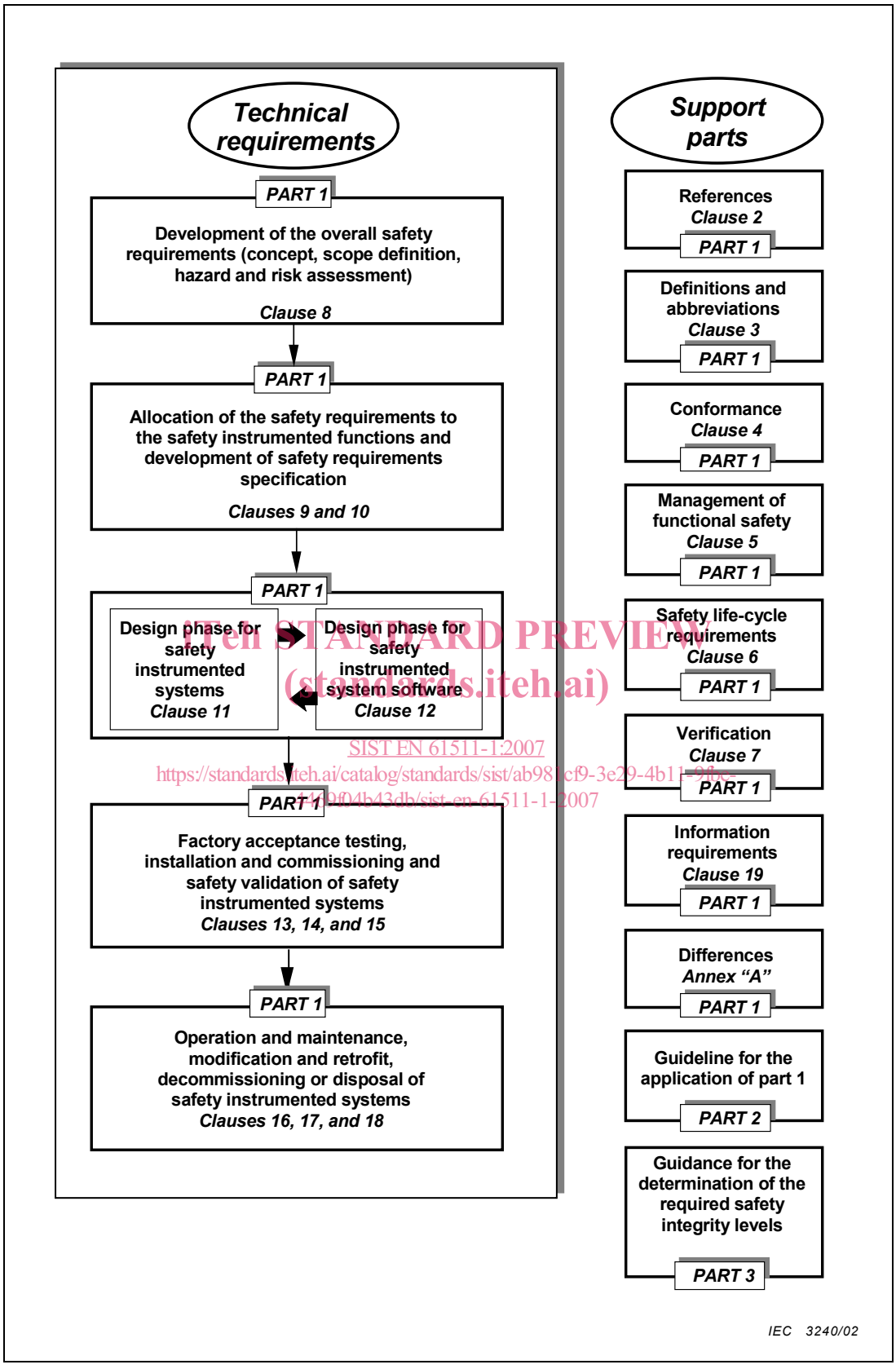

Figure 1 – Overall framework of this standard