

INTERNATIONAL STANDARD

IEC 61511-2

First edition
2003-07

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

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



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International Electrotechnical Commission
Международная Электротехническая Комиссия

CONTENTS

FOREWORD	4
INTRODUCTION	6
1 Scope	8
2 Normative references.....	8
3 Terms, definitions and abbreviations.....	8
4 Conformance to this International Standard	8
5 Management of functional safety.....	9
5.1 Objective	9
5.2 Requirements	9
6 Safety lifecycle requirements	15
6.1 Objective	15
6.2 Requirements	15
7 Verification	15
7.1 Objective	15
8 Process hazard and risk assessment	16
8.1 Objectives	16
8.2 Requirements	16
9 Allocation of safety functions to protection layers.....	19
9.1 Objective	19
9.2 Requirements of the allocation process	19
9.3 Additional requirements for safety integrity level 4	21
9.4 Requirement on the basic process control system as a layer of protection	21
9.5 Requirements for preventing common cause, common mode and dependent failures	22
10 SIS safety requirements specification	23
10.1 Objective	23
10.2 General requirements	23
10.3 SIS safety requirements.....	23
11 SIS design and engineering	24
11.1 Objective	24
11.2 General requirements	24
11.3 Requirements for system behaviour on detection of a fault	28
11.4 Requirements for hardware fault tolerance.....	28
11.5 Requirements for selection of components and subsystems	30
11.6 Field devices	32
11.7 Interfaces	32
11.8 Maintenance or testing design requirements	34
11.9 SIF probability of failure.....	35
12 Requirements for application software, including selection criteria for utility software.....	37
12.1 Application software safety lifecycle requirements	37
12.2 Application software safety requirements specification.....	40
12.3 Application software safety validation planning	42
12.4 Application software design and development.....	42

12.5	Integration of the application software with the SIS subsystem	49
12.6	FPL and LVL software modification procedures	49
12.7	Application software verification.....	50
13	Factory acceptance testing (FAT)	51
13.1	Objectives	51
13.2	Recommendations	51
14	SIS installation and commissioning.....	52
14.1	Objectives	52
14.2	Requirements	52
15	SIS safety validation	52
15.1	Objective	52
15.2	Requirements	52
16	SIS operation and maintenance	53
16.1	Objectives	53
16.2	Requirements	53
16.3	Proof testing and inspection.....	53
17	SIS modification.....	55
17.1	Objective	55
17.2	Requirements	55
18	SIS decommissioning.....	55
18.1	Objectives	55
18.2	Requirements	55
19	Information and documentation requirements.....	55
19.1	Objectives	55
19.2	Requirements	55
Annex A (informative) Example of techniques for calculating the probability of failure on demand for a safety instrumented function		57
Annex B (informative) Typical SIS architecture development.....		58
Annex C (informative) Application features of a safety PLC.....		63
Annex D (informative) Example of SIS logic solver application software development methodology		65
Annex E (informative) Example of development of externally configured diagnostics for a safety-configured PE logic solver		69
Figure 1 – Overall framework of this standard		7
Figure 2 – BPCS function and initiating cause independence illustration		21
Figure 3 – Software development lifecycle (the V-model)		38
Figure C.1 – Logic solver		64
Figure E.1 – EWDT timing diagram		71
Table 1 – Typical Safety Manual organisation and contents		47

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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

FOREWORD

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International Standard IEC 61511-2 has been prepared by subcommittee 65A: System aspects, of IEC technical committee 65: Industrial-process measurement and control.

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

FDIS	Report on voting
65A/387A/FDIS	65A/390/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 61511 series has been developed as a process sector implementation of IEC 61508 series.

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 for 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.

A bilingual version of this standard may be issued at a later date.

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.

This International Standard addresses the application of safety instrumented systems for the Process Industries. It also deals with the interface between safety instrumented systems and other safety systems in requiring that a process hazard and risk assessment be carried out. The safety instrumented system includes sensors, logic solvers and final elements.

This International Standard has two concepts, which are fundamental to its application; safety lifecycle and safety integrity levels. The safety lifecycle forms the central framework which links together most of the concepts in this International Standard.

The safety instrumented system logic solvers addressed include Electrical (E)/Electronic (E)/ and Programmable Electronic (PE) technology. Where other technologies are used for logic solvers, the basic principles of this standard may also be applied. This standard also addresses the safety instrumented system sensors and final elements regardless of the technology used. This International Standard is process industry specific within the framework of the IEC 61508 series.

This International Standard sets out an approach for safety lifecycle activities to achieve these minimum standards. This approach has been adopted in order that a rational and consistent technical policy is used. The objective of this standard is to provide guidance on how to comply with IEC 61511-1.

To facilitate use of this standard, the clause and subclause numbers provided are identical to the corresponding normative text in 61511-1 (excluding the annexes).

In most situations, safety is best achieved by an inherently safe process design whenever practicable, combined, if necessary, with a number of protective systems which rely on different technologies (for example, chemical, mechanical, hydraulic, pneumatic, electrical, electronic, thermodynamic (for example, flame arrestors), programmable electronic) which manage any residual identified risk. Any safety strategy considers each individual safety instrumented system in the context of the other protective systems. 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 functions and related safety systems, such as 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 International Standard on safety instrumented systems for the process industry:

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

This 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.

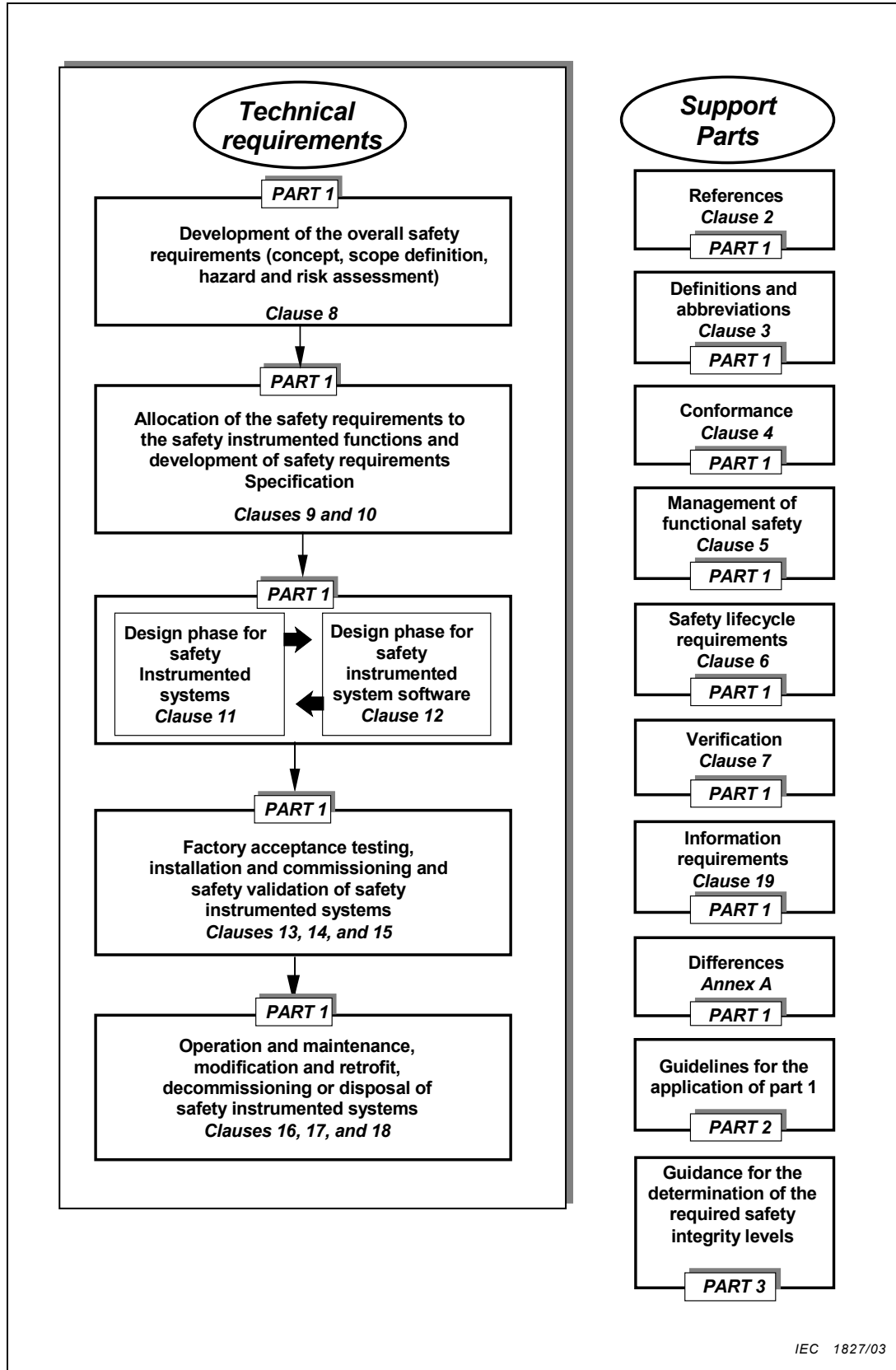


Figure 1 – Overall framework of this standard