



# SLOVENSKI STANDARD

## SIST EN 61511-2:2017

01-september-2017

Nadomešča:  
SIST EN 61511-2:2007

---

**Funkcijska varnost - Sistemi z varnostnimi instrumenti za sektor procesne industrije - 2. del: Smernice za uporabo IEC 61511-1 (IEC 61511-2:2016)**

Functional safety - Safety instrumented systems for the process industry sector - Part 2: Guidelines for the application of IEC 61511-1 (IEC 61511-2:2016)

Funktionale Sicherheit - Part 2: Sicherheitseinrichtungen für die Prozessindustrie - Teil 2: Anleitungen zur Anwendung des Teils 1 (IEC 61511-2:2016)

Sécurité fonctionnelle - Systèmes instrumentés de sécurité pour le secteur des industries de transformation - Partie 2: Directives pour l'application de l'IEC 61511-1 (IEC 61511-2:2016)

**Ta slovenski standard je istoveten z: EN 61511-2:2017**

**ICS:**

25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control
-----------	--	--

**SIST EN 61511-2:2017** en,fr,de

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 61511-2:2017

<https://standards.iteh.ai/catalog/standards/sist/634988f7-4aa8-4048-b558-1c51f82279ef/sist-en-61511-2-2017>

EUROPEAN STANDARD

**EN 61511-2**

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2017

ICS 13.110; 25.040.01

Supersedes EN 61511-2:2004

English Version

Functional safety - Safety instrumented systems for the process  
industry sector - Part 2: Guidelines for the application of IEC  
61511-1  
(IEC 61511-2:2016)

Sécurité fonctionnelle - Systèmes instrumentés de sécurité  
pour le secteur des industries de transformation - Partie 2:  
Lignes directives pour l'application de l'IEC 61511-1  
(IEC 61511-2:2016)

Funktionale Sicherheit - PLT-Sicherheitseinrichtungen für  
die Prozessindustrie - Teil 2: Anleitungen zur Anwendung  
des Teils 1  
(IEC 61511-2:2016)

This European Standard was approved by CENELEC on 2016-09-01. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

<https://standards.iteh.ai/catalog/standards/sist/634988f7-4aa8-4048-b558-1c5182279ef/sist-en-61511-2-2017>

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



European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

**EN 61511-2:2017****European foreword**

The text of document 65A/783/FDIS, future edition 2 of IEC 61511-2, prepared by SC 65A "System aspects" of IEC/TC 65 "Industrial process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61511-2:2017.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2017-10-21
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-04-21

This document supersedes EN 61511-2:2004.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

**Endorsement notice**

The text of the International Standard IEC 61511-2:2016 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

	<u>SIST EN 61511-2:2017</u>	
IEC 60880:2006	NOTE	Harmonized as EN 60880:2009-4048-b558-1c51f82279ef/sist-en-61511-2-2017
IEC 61025:2006	NOTE	Harmonized as EN 61025:2007.
IEC 61078:2006	NOTE	Harmonized as EN 61078:2006.
IEC 61131-3:2013	NOTE	Harmonized as EN 61131-3:2013.
IEC 61165:2006	NOTE	Harmonized as EN 61165:2006.
IEC 61508-1:2010	NOTE	Harmonized as EN 61508-1:2010.
IEC 61508-2:2010	NOTE	Harmonized as EN 61508-2:2010.
IEC 61508-3:2010	NOTE	Harmonized as EN 61508-3:2010.
IEC 61508-6:2010	NOTE	Harmonized as EN 61508-6:2010.
IEC 61508-6:2010	NOTE	Harmonized as EN 61508-6:2010.
IEC 62061:2005	NOTE	Harmonized as EN 62061:2005.
IEC 62502:2010	NOTE	Harmonized as EN 62502:2010.
IEC 62551:2012	NOTE	Harmonized as EN 62551:2012.
ISO 9000:2015	NOTE	Harmonized as EN ISO 9000:2015.

ISO 10418:2003	NOTE	Harmonized as EN ISO 10418:2003.
ISO/TR 12489:2013	NOTE	Harmonized as CEN ISO/TR 12489:2016.
ISO 17776:2000	NOTE	Harmonized as EN ISO 17776:2002.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 61511-2:2017](https://standards.iteh.ai/catalog/standards/sist/634988f7-4aa8-4048-b558-1c51f82279ef/sist-en-61511-2-2017)

<https://standards.iteh.ai/catalog/standards/sist/634988f7-4aa8-4048-b558-1c51f82279ef/sist-en-61511-2-2017>

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61511-1	2016	Functional safety - Safety instrumented systems for the process industry sector - Normative (uon) -- Part 1: Framework, definitions, system, hardware and software requirements	EN 61511-1	2016

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 61511-2:2017](https://standards.iteh.ai/catalog/standards/sist/634988f7-4aa8-4048-b558-1c51f82279ef/sist-en-61511-2-2017)

<https://standards.iteh.ai/catalog/standards/sist/634988f7-4aa8-4048-b558-1c51f82279ef/sist-en-61511-2-2017>



IEC 61511-2

Edition 2.0 2016-07

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



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

**Part 2: Guidelines for the application of IEC 61511-1: 2016**

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

**Partie 2: Lignes directrices pour l'application de l'IEC 61511-1:2016**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

ICS 13.110; 25.040.01

ISBN 978-2-8322-3227-9

**Warning! Make sure that you obtained this publication from an authorized distributor.  
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

## CONTENTS

FOREWORD.....	9
INTRODUCTION.....	11
1 Scope.....	13
2 Normative references .....	13
3 Terms, definitions, and abbreviations .....	13
Annex A (informative) Guidance for IEC 61511-1.....	14
A.1 Scope .....	14
A.2 Normative references .....	14
A.3 Terms, definitions and abbreviations.....	14
A.4 Conformance to the IEC 61511-1:–.....	14
A.5 Management of functional safety .....	14
A.5.1 Objective .....	14
A.5.2 Guidance to "Requirements".....	14
A.6 Safety life-cycle requirements.....	23
A.6.1 Objectives.....	23
A.6.2 Guidance to "Requirements".....	23
A.6.3 Guidance to "Application program SIS safety life-cycle requirements" .....	24
A.7 Verification.....	25
A.7.1 Objective .....	25
A.7.2 Guidance to "Requirements".....	25
A.8 Process hazard and risk assessment (H&RA).....	27
A.8.1 Objectives.....	27
A.8.2 Guidance to "Requirements".....	27
A.9 Allocation of safety functions to protection layers .....	30
A.9.1 Objective .....	30
A.9.2 Guidance to "Requirements of the allocation process".....	30
A.9.3 Guidance to "Requirements on the basic process control system as a protection layer".....	32
A.9.4 Guidance to "Requirements for preventing common cause, common mode and dependent failures" .....	35
A.10 SIS safety requirements specification .....	36
A.10.1 Objective .....	36
A.10.2 Guidance to "General requirements".....	36
A.10.3 Guidance to "SIS safety requirements" .....	36
A.11 SIS design and engineering.....	40
A.11.1 Objective .....	40
A.11.2 Guidance to "General requirements".....	40
A.11.3 Guidance to "Requirements for system behaviour on detection of a fault".....	47
A.11.4 Guidance to "Hardware fault tolerance" .....	47
A.11.5 Guidance to "Requirements for selection of devices".....	50
A.11.6 Field devices .....	53
A.11.7 Interfaces .....	53
A.11.8 Guidance to "Maintenance or testing design requirements" .....	55
A.11.9 Guidance to "Quantification of random failure".....	56
A.12 SIS application program development.....	62



A.12.1	Objective .....	62
A.12.2	Guidance to "General requirements" .....	62
A.12.3	Guidance to "Application program design" .....	64
A.12.4	Guidance to "Application program implementation" .....	66
A.12.5	Guidance to "Requirements for application program verification (review and testing)" .....	67
A.12.6	Guidance to "Requirements for application program methodology and tools" .....	70
A.13	Factory acceptance testing (FAT) .....	73
A.13.1	Objectives .....	73
A.13.2	Guidance to "Recommendations" .....	73
A.14	SIS installation and commissioning .....	73
A.14.1	Objectives .....	73
A.14.2	Guidance to "Requirements" .....	73
A.15	SIS safety validation .....	74
A.15.1	Objective .....	74
A.15.2	Guidance to "Requirements" .....	74
A.16	SIS operation and maintenance .....	74
A.16.1	Objectives .....	74
A.16.2	Guidance to "Requirements" .....	75
A.16.3	Proof testing and inspection .....	76
A.17	SIS modification .....	78
A.17.1	Objective .....	78
A.17.2	Guidance to "Requirements" .....	79
A.18	SIS decommissioning .....	79
A.18.1	Objectives .....	79
A.18.2	Guidance to "Requirements" .....	79
A.19	Information and documentation requirements .....	80
A.19.1	Objectives .....	80
A.19.2	Guidance to "Requirements" .....	80
Annex B (informative)	Example of SIS logic solver application program development using function block diagram .....	81
B.1	General .....	81
B.2	Application program development and validation philosophy .....	81
B.3	Application description .....	82
B.3.1	General .....	82
B.3.2	Process description .....	82
B.3.3	Safety instrumented functions .....	83
B.3.4	Risk reduction and domino effects .....	84
B.4	Application program safety life-cycle execution .....	84
B.4.1	General .....	84
B.4.2	Inputs to application program SRS development .....	84
B.4.3	Application program design and development .....	87
B.4.4	Application program production .....	101
B.4.5	Application program verification and testing .....	101
B.4.6	Validation .....	101
Annex C (informative)	Considerations when converting from NP technologies to PE technologies .....	102

Annex D (informative) Example of how to get from a piping and instrumentation diagram (P&ID) to application program .....	104
Annex E (informative) Methods and tools for application programming .....	107
E.1 Typical toolset for application programming .....	107
E.2 Rules and constraints for application program design .....	108
E.3 Rules and constraints for application programming .....	108
Annex F (informative) Example SIS project illustrating each phase of the safety life cycle with application program development using relay ladder language .....	110
F.1 Overview .....	110
F.2 Project definition .....	110
F.2.1 General .....	110
F.2.2 Conceptual planning .....	111
F.2.3 Process hazards analysis .....	111
F.3 Simplified process description .....	111
F.4 Preliminary design .....	113
F.5 IEC 61511 application .....	113
F.5.1 General .....	113
F.5.2 Step F.1: Hazard & risk assessment .....	117
F.5.3 Hazard identification .....	117
F.5.4 Preliminary hazard evaluation .....	117
F.5.5 Accident history .....	117
F.6 Preliminary process design safety considerations .....	120
F.7 Recognized process hazards .....	120
F.8 Process design definitions strategy .....	121
F.9 Preliminary hazard assessment .....	124
F.9.1 General .....	124
F.9.2 Step F.2: Allocation of safety functions .....	128
F.10 SIF safety integrity level determination .....	129
F.11 Layer of protection analysis (LOPA) applied to example .....	129
F.12 Tolerable risk criteria .....	130
F.13 Step F.3: SIS safety requirements specifications .....	133
F.13.1 Overview .....	133
F.13.2 Input requirements .....	133
F.13.3 Safety functional requirements .....	134
F.13.4 Safety integrity requirements .....	135
F.14 Functional description and conceptual design .....	136
F.14.1 Narrative for example reactor system logic .....	136
F.15 SIL verification calculations .....	137
F.16 Application program requirements .....	144
F.17 Step F.4: SIS safety life-cycle .....	151
F.18 Technology and device selection .....	151
F.18.1 General .....	151
F.18.2 Logic solver .....	151
F.18.3 Sensors .....	152
F.18.4 Final elements .....	152
F.18.5 Solenoid valves .....	152
F.18.6 Emergency vent valves .....	153
F.18.7 Modulating valves .....	153
F.18.8 Bypass valves .....	153

F.18.9	Human-machine interfaces (HMIs).....	153
F.18.10	Separation.....	154
F.19	Common cause and systematic failures.....	155
F.19.1	General.....	155
F.19.2	Diversity.....	155
F.19.3	Specification errors.....	155
F.19.4	Hardware design errors.....	155
F.19.5	Software design errors.....	156
F.19.6	Environmental overstress.....	156
F.19.7	Temperature.....	156
F.19.8	Humidity.....	156
F.19.9	Contaminants.....	157
F.19.10	Vibration.....	157
F.19.11	Grounding.....	157
F.19.12	Power line conditioning.....	157
F.19.13	Electro-magnetic compatibility (EMC).....	157
F.19.14	Utility sources.....	158
F.19.15	Sensors.....	159
F.19.16	Process corrosion or fouling.....	159
F.19.17	Maintenance.....	159
F.19.18	Susceptibility to mis-operation.....	159
F.19.19	SIS architecture.....	159
F.20	SIS application program design features.....	160
F.21	Wiring practices.....	161
F.22	Security.....	161
F.23	Step F.5: SIS installation, commissioning, validation.....	162
F.24	Installation.....	162
F.25	Commissioning.....	163
F.26	Documentation.....	164
F.27	Validation.....	164
F.28	Testing.....	165
F.29	Step F.6: SIS operation and maintenance.....	178
F.30	Step F.7: SIS Modification.....	181
F.31	Step F.8: SIS decommissioning.....	181
F.32	Step F.9: SIS verification.....	181
F.33	Step F.10: Management of functional safety and SIS FSA.....	182
F.34	Management of functional safety.....	183
F.34.1	General.....	183
F.34.2	Competence of personnel.....	183
F.35	Functional safety assessment.....	183
Annex G (informative)	Guidance on developing application programming practices.....	184
G.1	Purpose of this guidance.....	184
G.2	Generic safe application programming attributes.....	184
G.3	Reliability.....	184
G.3.1	General.....	184
G.3.2	Predictability of memory utilisation.....	185
G.3.3	Predictability of control flow.....	186
G.3.4	Accounting for precision and accuracy.....	188
G.3.5	Predictability of timing.....	190

G.4	Predictability of mathematical or logical result.....	190
G.5	Robustness.....	191
G.5.1	General .....	191
G.5.2	Controlling use of diversity .....	191
G.5.3	Controlling use of exception handling .....	192
G.5.4	Checking input and output.....	193
G.6	Traceability .....	194
G.6.1	General .....	194
G.6.2	Controlling use of built-in functions.....	194
G.6.3	Controlling use of compiled libraries .....	194
G.7	Maintainability.....	194
G.7.1	General .....	194
G.7.2	Readability.....	195
G.7.3	Data abstraction.....	198
G.7.4	Functional cohesiveness .....	199
G.7.5	Malleability .....	199
G.7.6	Portability .....	199
	Bibliography .....	201
	Figure 1 – Overall framework of IEC 61511 series.....	12
	Figure A.1 – Application program V-Model.....	25
	Figure A.2 – Independence of a BPCS protection layer and an initiating source in the BPCS .....	34
	Figure A.3 – Independence of two protection layers allocated to the BPCS .....	35
	Figure A.4 – Relationship of system, SIS hardware, and SIS application program.....	39
	Figure A.5 – Illustration of uncertainties on a reliability parameter.....	60
	Figure A.6 – Illustration of the 70 % confidence upper bound .....	61
	Figure A.7 – Typical probabilistic distribution of target results from Monte Carlo simulation.....	62
	Figure B.1 – Process flow diagram for SIF 02.01 .....	83
	Figure B.2 – Process flow diagram for SIF 06.02 .....	84
	Figure B.3 – Functional specification of SIF02.01 and SIF 06.02.....	85
	Figure B.4 – SIF 02.01 hardware functional architecture .....	85
	Figure B.5 – SIF 06.02 hardware functional architecture .....	86
	Figure B.6 – Hardware specification for SOV extracted from piping and instrumentation diagram.....	86
	Figure B.7 – SIF 02.01 hardware physical architecture .....	87
	Figure B.8 – SIF 06.02 hardware physical architecture .....	87
	Figure B.9 – Hierarchical structure of model integration .....	91
	Figure B.10 – Hierarchical structure of model integration including models of safety properties and of BPCS logic .....	93
	Figure B.11 – State transition diagram .....	94
	Figure B.12 – SOV typical block diagram.....	95
	Figure B.13 – SOV typical model block diagram .....	96
	Figure B.14 – Typical model block diagram implementation – BPCS part.....	98
	Figure B.15 – SOV application program typical model implementation – SIS part .....	99

Figure B.16 – Complete model for final implementation model checking .....	101
Figure D.1 – Example of P&ID for an oil and gas separator .....	104
Figure D.2 – Example of (part of) an ESD cause & effect diagram (C&E).....	105
Figure D.3 – Example of (part of) an application program in a safety PLC function block programming .....	106
Figure F.1 – Simplified flow diagram: the PVC process .....	112
Figure F.2 – SIS safety life-cycle phases and FSA stages.....	114
Figure F.3 – Example of the preliminary P&ID for PVC reactor unit .....	123
Figure F.4 – SIF S-1 Bubble diagram showing the $PFD_{avg}$ of each SIS device.....	139
Figure F.5 – S-1 Fault tree .....	140
Figure F.6 – SIF S-2 Bubble diagram showing the $PFD_{avg}$ of each SIS device.....	141
Figure F.7 – SIF S-2 fault tree.....	142
Figure F.8 – SIF S-3 Bubble diagram showing the $PFD_{avg}$ of each SIS device.....	143
Figure F.9 – SIF S-3 fault tree.....	144
Figure F.10 – P&ID for PVC reactor unit SIF.....	145
Figure F.11 – Legend (1 of 5).....	146
Figure F.12 – SIS for the VCM reactor.....	160
<b>STANDARD PREVIEW</b>	
Table B.1 – Modes of operation specification.....	88
Table B.2 – State transition table.....	93
Table F.1 – SIS safety life-cycle overview .....	115
Table F.2 – SIS safety life-cycle – Box 1.....	117
Table F.3 – Some physical properties of vinyl chloride.....	119
Table F.4 – What-If/Checklist .....	125
Table F.5 – HAZOP .....	126
Table F.6 – Partial summary of hazard assessment for SIF strategy development .....	127
Table F.7 – SIS safety life-cycle – Box 2 .....	129
Table F.8 – Tolerable risk ranking .....	131
Table F.9 – VCM reactor example: LOPA based integrity level.....	132
Table F.10 – SIS safety life-cycle – Box 3 .....	133
Table F.11 – Safety instrumented functions and SILs.....	133
Table F.12 – Functional relationship of I/O for the SIF(s) .....	134
Table F.13 – SIS sensors, normal operating range & trip points .....	134
Table F.14 – Cause and effect diagram .....	137
Table F.15 – MTTFd figures of SIS F.1 devices .....	138
Table F.16 – SIS safety life-cycle – Box 4 .....	151
Table F.17 – SIS safety life-cycle – Box 5 .....	162
Table F.18 – List of instrument types and testing procedures used.....	166
Table F.19 – Interlock check procedure bypass/simulation check sheet.....	178
Table F.20 – SIS safety life-cycle – Box 6 .....	178
Table F.21 – SIS trip log .....	179
Table F.22 – SIS device failure log.....	179
Table F.23 – SIS safety life-cycle – Box 7 .....	181

Table F.24 – SIS safety life-cycle – Box 8 .....	181
Table F.25 – SIS safety life-cycle – Box 9 .....	182
Table F.26 – SIS safety life-cycle – Box 10.....	182

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 61511-2:2017](https://standards.iteh.ai/catalog/standards/sist/634988f7-4aa8-4048-b558-1c51f82279ef/sist-en-61511-2-2017)

<https://standards.iteh.ai/catalog/standards/sist/634988f7-4aa8-4048-b558-1c51f82279ef/sist-en-61511-2-2017>

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

---

**FUNCTIONAL SAFETY –  
SAFETY INSTRUMENTED SYSTEMS  
FOR THE PROCESS INDUSTRY SECTOR –****Part 2: Guidelines for the application of IEC 61511-1:2016****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 itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 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 61511-2 has been prepared by subcommittee 65A: System aspects, of IEC technical committee 65: Industrial-process measurement, control and automation.

This second edition cancels and replaces the first edition published in 2003. This edition constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition:

- guidance examples based on all phases of the safety life cycle provided based on usage experience with IEC61511 1<sup>st</sup> edition;
- annexes replaced to address transition from software to application programming.