



# SLOVENSKI STANDARD

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**Funkcijska varnost - Sistemi z varnostnimi instrumenti za sektor procesne industrije - 3. del: Smernice za ugotavljanje zahtevanih nivojev celovite varnosti (IEC 61511-3:2016)**

Functional safety - Safety instrumented systems for the process industry sector - Part 3: Guidance for the determination of the required safety integrity levels (IEC 61511-3:2016)

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Funktionale Sicherheit - PLT-Sicherheitseinrichtungen für die Prozessindustrie - Teil 3: Anleitung für die Bestimmung der erforderlichen Sicherheits-Integritätslevel (IEC 61511-3:2016)

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Sécurité fonctionnelle - Systèmes instrumentés de sécurité pour le secteur des industries de transformation - Partie 3: Conseils pour la détermination des niveaux exigés d'intégrité de sécurité (IEC 61511-3:2016)

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**ICS:**

25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control
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**Functional safety - Safety instrumented systems for the process industry sector - Part 3: Guidance for the determination of the required safety integrity levels (IEC 61511-3:2016)**

Sécurité fonctionnelle - Systèmes instrumentés de sécurité pour le secteur des industries de transformation - Partie 3: Conseils pour la détermination des niveaux exigés d'intégrité de sécurité (IEC 61511-3:2016)

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**EN 61511-3:2017****European foreword**

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<u>SIST EN 61511-3:2017</u>		
IEC 61025:2006	NOTE	Harmonized as EN 61025:2007. <a href="https://standards.iteh.ai/catalog/standards/sist/en-61025-2007/4024-af76-9aaa7b4847f9/sist-en-61511-3-2017">https://standards.iteh.ai/catalog/standards/sist/en-61025-2007/4024-af76-9aaa7b4847f9/sist-en-61511-3-2017</a>
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IEC 61508-6:2010	NOTE	Harmonized as EN 61508-6:2010.
IEC 62551:2012	NOTE	Harmonized as EN 62551:2012.
ISO/TR 12489:2013	NOTE	Harmonized as CEN ISO/TR 12489:2016.

## 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>
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# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Functional safety – Safety instrumented systems for the process industry sector –  
Part 3: Guidance for the determination of the required safety integrity levels**

**Sécurité fonctionnelle – Systèmes instrumentés de sécurité pour le secteur des industries de transformation –  
Partie 3: Conseils pour la détermination des niveaux exigés d'intégrité de sécurité**

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## CONTENTS

FOREWORD.....	7
INTRODUCTION.....	9
1 Scope.....	12
2 Normative references .....	13
3 Terms, definitions and abbreviations .....	13
Annex A (informative) Risk and safety integrity – general guidance.....	14
A.1 General.....	14
A.2 Necessary risk reduction .....	14
A.3 Role of safety instrumented systems.....	14
A.4 Risk and safety integrity .....	16
A.5 Allocation of safety requirements.....	17
A.6 Hazardous event, hazardous situation and harmful event.....	17
A.7 Safety integrity levels .....	18
A.8 Selection of the method for determining the required safety integrity level .....	18
Annex B (informative) Semi-quantitative method – event tree analysis .....	20
B.1 Overview .....	20
B.2 Compliance with IEC 61511-1:2016.....	20
B.3 Example .....	20
B.3.1 General .....	20
B.3.2 Process safety target .....	21
B.3.3 Hazard analysis .....	21
B.3.4 Semi-quantitative risk analysis technique.....	22
B.3.5 Risk analysis of existing process.....	23
B.3.6 Events that do not meet the process safety target.....	25
B.3.7 Risk reduction using other protection layers.....	26
B.3.8 Risk reduction using a safety instrumented function .....	26
Annex C (informative) The safety layer matrix method .....	28
C.1 Overview .....	28
C.2 Process safety target .....	29
C.3 Hazard analysis .....	29
C.4 Risk analysis technique.....	30
C.5 Safety layer matrix .....	31
C.6 General procedure .....	32
Annex D (informative) A semi-qualitative method: calibrated risk graph.....	34
D.1 Overview .....	34
D.2 Risk graph synthesis .....	34
D.3 Calibration .....	35
D.4 Membership and organization of the team undertaking the SIL assessment.....	36
D.5 Documentation of results of SIL determination .....	37
D.6 Example calibration based on typical criteria.....	37
D.7 Using risk graphs where the consequences are environmental damage .....	40
D.8 Using risk graphs where the consequences are asset loss .....	41
D.9 Determining the integrity level of instrument protection function where the consequences of failure involve more than one type of loss.....	41
Annex E (informative) A qualitative method: risk graph .....	42



E.1	General.....	42
E.2	Typical implementation of instrumented functions .....	42
E.3	Risk graph synthesis .....	43
E.4	Risk graph implementation: personnel protection .....	43
E.5	Relevant issues to be considered during application of risk graphs.....	45
Annex F (informative) Layer of protection analysis (LOPA) .....		47
F.1	Overview .....	47
F.2	Impact event .....	48
F.3	Severity level .....	48
F.4	Initiating cause.....	49
F.5	Initiation likelihood .....	50
F.6	Protection layers .....	50
F.7	Additional mitigation.....	51
F.8	Independent protection layers (IPL).....	51
F.9	Intermediate event likelihood .....	52
F.10	SIF integrity level .....	52
F.11	Mitigated event likelihood .....	52
F.12	Total risk.....	52
F.13	Example .....	53
F.13.1	General .....	53
F.13.2	Impact event and severity level .....	53
F.13.3	Initiating cause .....	53
F.13.4	Initiating likelihood .....	53
F.13.5	General process design .....	53
F.13.6	BPCS .....	53
F.13.7	Alarms .....	53
F.13.8	Additional mitigation.....	54
F.13.9	Independent protection layer(s) (IPL).....	54
F.13.10	Intermediate event likelihood .....	54
F.13.11	SIS .....	54
F.13.12	Next SIF .....	54
Annex G (informative) Layer of protection analysis using a risk matrix .....		56
G.1	Overview .....	56
G.2	Procedure.....	58
G.2.1	General .....	58
G.2.2	Step 1: General Information and node definition .....	58
G.2.3	Step 2: Describe hazardous event .....	59
G.2.4	Step 3: Evaluate initiating event frequency .....	62
G.2.5	Step 4: Determine hazardous event consequence severity and risk reduction factor .....	63
G.2.6	Step 5: Identify independent protection layers and risk reduction factor .....	64
G.2.7	Step 6: Identify consequence mitigation systems and risk reduction factor .....	65
G.2.8	Step 7: Determine CMS risk gap.....	66
G.2.9	Step 8: Determine scenario risk gap .....	69
G.2.10	Step 9: Make recommendations when needed .....	69
Annex H (informative) A qualitative approach for risk estimation & safety integrity level (SIL) assignment .....		71
H.1	Overview .....	71

H.2	Risk estimation and SIL assignment .....	73
H.2.1	General .....	73
H.2.2	Hazard identification/indication .....	73
H.2.3	Risk estimation .....	73
H.2.4	Consequence parameter selection (C) (Table H.2) .....	74
H.2.5	Probability of occurrence of that harm .....	75
H.2.6	Estimating probability of harm .....	77
H.2.7	SIL assignment .....	77
Annex I (informative)	Designing & calibrating a risk graph .....	80
I.1	Overview .....	80
I.2	Steps involved in risk graph design and calibration .....	80
I.3	Risk graph development .....	80
I.4	The risk graph parameters .....	81
I.4.1	Choosing parameters .....	81
I.4.2	Number of parameters .....	81
I.4.3	Parameter value .....	81
I.4.4	Parameter definition .....	81
I.4.5	Risk graph .....	82
I.4.6	Tolerable event frequencies (Tef) for each consequence .....	82
I.4.7	Calibration .....	83
I.4.8	Completion of the risk graph .....	84
Annex J (informative)	Multiple safety systems .....	85
J.1	Overview .....	85
J.2	Notion of systemic dependencies .....	85
J.3	Semi-quantitative approaches .....	88
J.4	Boolean approaches .....	89
J.5	State-transition approach .....	92
Annex K (informative)	As low as reasonably practicable (ALARP) and tolerable risk concepts .....	96
K.1	General .....	96
K.2	ALARP model .....	96
K.2.1	Overview .....	96
K.2.2	Tolerable risk target .....	97
Bibliography	.....	99
Figure 1	– Overall framework of the IEC 61511 series .....	11
Figure 2	– Typical protection layers and risk reduction means .....	13
Figure A.1	– Risk reduction: general concepts .....	16
Figure A.2	– Risk and safety integrity concepts .....	17
Figure A.3	– Harmful event progression .....	18
Figure A.4	– Allocation of safety requirements to the non-SIS protection layers and other protection layers .....	19
Figure B.1	– Pressurized vessel with existing safety systems .....	21
Figure B.2	– Fault tree for overpressure of the vessel .....	24
Figure B.3	– Hazardous events with existing safety systems .....	25
Figure B.4	– Hazardous events with SIL 2 safety instrumented function .....	27
Figure C.1	– Protection layers .....	28

Figure C.2 – Example of safety layer matrix.....	32
Figure D.1 – Risk graph: general scheme .....	38
Figure D.2 – Risk graph: environmental loss.....	41
Figure E.1 – VDI/VDE 2180 Risk graph – personnel protection and relationship to SILs.....	44
Figure F.1 – Layer of protection analysis (LOPA) report.....	49
Figure G.1 – Layer of protection graphic highlighting proactive and reactive IPL.....	56
Figure G.2 – Work process used for Annex G .....	58
Figure G.3 – Example process node boundary for selected scenario .....	59
Figure G.4 – Acceptable secondary consequence risk .....	67
Figure G.5 – Unacceptable secondary consequence risk .....	67
Figure G.6 – Managed secondary consequence risk .....	69
Figure H.1 – Workflow of SIL assignment process .....	72
Figure H.2 – Parameters used in risk estimation .....	74
Figure I.1 – Risk graph parameters to consider.....	81
Figure I.2 – Illustration of a risk graph with parameters from Figure I.1.....	82
Figure J.1 – Conventional calculations .....	85
Figure J.2 – Accurate calculations.....	86
Figure J.3 – Redundant SIS .....	88
Figure J.4 – Corrective coefficients for hazardous event frequency calculations when the proof tests are performed at the same time.....	89
Figure J.5 – Expansion of the simple example .....	89
Figure J.6 – Fault tree modelling of the multi SIS presented in Figure J.5.....	90
Figure J.7 – Modelling CCF between SIS <sub>1</sub> and SIS <sub>2</sub> .....	91
Figure J.8 – Effect of tests staggering .....	91
Figure J.9 – Effect of partial stroking .....	92
Figure J.10 – Modelling of repair resource mobilisation.....	93
Figure J.11 – Example of output from Monte Carlo simulation .....	94
Figure J.12 – Impact of repairs due to shared repair resources .....	95
Figure K.1 – Tolerable risk and ALARP .....	97
Table B.1 – HAZOP study results .....	22
Table C.1 – Frequency of hazardous event likelihood (without considering PLs).....	31
Table C.2 – Criteria for rating the severity of impact of hazardous events.....	31
Table D.1 – Descriptions of process industry risk graph parameters.....	35
Table D.2 – Example calibration of the general purpose risk graph .....	39
Table D.3 – General environmental consequences .....	40
Table E.1 – Data relating to risk graph (see Figure E.1).....	45
Table F.1 – HAZOP developed data for LOPA .....	48
Table F.2 – Impact event severity levels.....	49
Table F.3 – Initiation likelihood.....	50
Table F.4 – Typical protection layers (prevention and mitigation) PFD <sub>avg</sub> .....	51
Table G.1 – Selected scenario from HAZOP worksheet.....	59
Table G.2 – Selected scenario from LOPA worksheet .....	61

Table G.3 – Example initiating causes and associated frequency .....	63
Table G.4 – Consequence severity decision table .....	64
Table G.5 – Risk reduction factor matrix .....	64
Table G.6 – Examples of independent protection layers (IPL) with associated risk reduction factors (RRF) and probability of failure on demand (PFD) .....	66
Table G.7 – Examples of consequence mitigation system (CMS) with associated risk reduction factors (RRF) and probability of failure on demand (PFD) .....	66
Table G.8 – Step 7 LOPA worksheet (1 of 2) .....	68
Table G.9 – Step 8 LOPA worksheet (1 of 2) .....	70
Table H.1 – List of SIFs and hazardous events to be assessed .....	73
Table H.2 – Consequence parameter/severity level .....	74
Table H.3 – Occupancy parameter/Exposure probability (F) .....	75
Table H.4 – Avoidance parameter/avoidance probability .....	76
Table H.5 – Demand rate parameter (W) .....	77
Table H.6 – Risk graph matrix (SIL assignment form for safety instrumented functions) .....	78
Table H.7 – Example of consequence categories .....	78
Table K.1 – Example of risk classification of incidents .....	98
Table K.2 – Interpretation of risk classes .....	98

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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

## 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 61511-3: 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:

Additional H&RA example(s) and quantitative analysis consideration annexes are provided.

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

FDIS	Report on voting
65A/779/FDIS	65A786/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 in the IEC 61511 series, published under the general title *Functional safety – Safety instrumented systems for the process industry sector*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

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## INTRODUCTION

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

The IEC 61511 series addresses the application of SIS for the process industries. A process hazard and risk assessment is carried out to enable the specification for SIS 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 SIS. The SIS includes all devices and subsystems necessary to carry out the SIF from sensor(s) to final element(s).

The IEC 61511 series has two concepts which are fundamental to its application; SIS safety life-cycle and safety integrity levels (SIL).

The IEC 61511 series addresses SIS which are based on the use of Electrical (E)/Electronic (E)/Programmable Electronic (PE) technology. Where other technologies are used for logic solvers, the basic principles of the IEC 61511 series should be applied. The IEC 61511 series also addresses the SIS sensors and final elements regardless of the technology used. The IEC 61511 series is process industry specific within the framework of IEC 61508:2010.

The IEC 61511 series sets out an approach for SIS 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, and programmable electronic). Any safety strategy should consider each individual SIS in the context of the other protective systems. To facilitate this approach, the IEC 61511 series covers:

- a hazard and risk assessment is carried out to identify the overall safety requirements;
- an allocation of the safety requirements to the SIS is carried out;
- works within a framework which is applicable to all instrumented means 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;
- addressing all SIS safety life-cycle phases from initial concept, design, implementation, operation and maintenance through to decommissioning;
- enabling existing or new country specific process industry standards to be harmonized with the IEC 61511 series.

The IEC 61511 series 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 regulations, these take precedence over the requirements defined in the IEC 61511-1.

The IEC 61511-3 deals with guidance in the area of determining the required SIL in hazards and risk assessment. The information herein is intended to provide a broad overview of the wide range of global methods used to implement hazards and risk assessment. The information provided is not of sufficient detail to implement any of these approaches.