

SLOVENSKI STANDARD

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Nadomešča:
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Nuklearne elektrarne - Merilni, nadzorni in elektroenergetski sistemi - Zahteve za statične neprekinjene enosmerne in izmenične napajalne sisteme (IEC 61225:2025)

Nuclear power plants - Instrumentation, control and electrical power systems - Requirements for static uninterruptible DC and AC power supply systems (IEC 61225:2025)

Kernkraftwerke - Leittechnische Systeme und elektrische Stromversorgungssysteme - Anforderungen an statische unterbrechungsfreie Gleich- und Wechselstrom-Energieversorgungssysteme (IEC 61225:2025)

Centrales nucléaire de puissance - Systèmes d'instrumentation, de contrôle-commande et d'alimentation électrique - Exigences pour les systèmes d'alimentation en courant alternatif et en courant continu statiques sans interruption (IEC 61225:2025)

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ICS:

27.120.20 Jedrske elektrarne. Varnost Nuclear power plants. Safety

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EUROPEAN STANDARD
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EN IEC 61225

July 2026

ICS 27.120.20

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**Nuclear power plants - Instrumentation, control and electrical
power systems - Requirements for static uninterruptible DC and
AC power supply systems
(IEC 61225:2025)**

Centrales nucléaire de puissance - Systèmes
d'instrumentation, de contrôle-commande et d'alimentation
électrique - Exigences pour les systèmes d'alimentation en
courant alternatif et en courant continu statiques sans
interruption
(IEC 61225:2025)

Kernkraftwerke - Leittechnische Systeme und elektrische
Stromversorgungssysteme - Anforderungen an statische
unterbrechungsfreie Gleich- und Wechselstrom-
Energieversorgungssysteme
(IEC 61225:2025)

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

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Ref. No. EN IEC 61225:2026 E

EN IEC 61225:2026 (E)**European foreword**

This document (EN IEC 61225:2026) consists of the text of document IEC 61225:2025, prepared by IEC/TC 45 “Instrumentation, control and electrical power systems of nuclear facilities”

The following dates are fixed:

- latest date by which this document has to be (dop) 2027-07-31 implemented at national level by publication of an identical national standard or by endorsement
- latest date by which the national standards (dow) 2029-07-31 conflicting with this document have to be withdrawn

This document supersedes EN IEC 61225:2020 and all of its amendments and corrigenda (if any).

This document is read in conjunction with EN 61513:2013, EN IEC 60709:2019, EN 60880:2009, EN IEC 62138:2019, EN IEC 62855:2021 and EN IEC 63046:2021.

As stated in the nuclear safety directive 2009/71/EURATOM, Chapter 1, Article 2, item 2, Member States are not prevented from taking more stringent safety measures in the subject-matter covered by the Directive, in compliance with Community law.

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IEC 60364 series	NOTE	Approved as HD 60364 series
IEC 60529	NOTE	Approved as EN 60529
IEC 60880	NOTE	Approved as EN 60880
IEC 60964	NOTE	Approved as EN IEC 60964
IEC 61000-6-2	NOTE	Approved as EN IEC 61000-6-2
IEC 61000-6-4	NOTE	Approved as EN IEC 61000-6-4
IEC 61000-6-5	NOTE	Approved as EN 61000-6-5
IEC 61226	NOTE	Approved as EN IEC 61226

IEC 61508 series	NOTE	Approved as EN 61508 series
IEC 62040-3	NOTE	Approved as EN IEC 62040-3
IEC 62138	NOTE	Approved as EN IEC 62138
IEC 62340	NOTE	Approved as EN 62340
IEC 62485-2	NOTE	Approved as EN IEC 62485-2
IEC 62566	NOTE	Approved as EN 62566
IEC 62566-2	NOTE	Approved as EN IEC 62566-2
IEC 62855	NOTE	Approved as EN IEC 62855
IEC 63046	NOTE	Approved as EN IEC 63046

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1 Where 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.cencenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60038	-	IEC standard voltages	EN 60038	-
IEC 60146-1-1	-	Semiconductor converters - General requirements and line commutated converters - Part 1-1: Specification of basic requirements	EN IEC 60146-1-1	-
IEC 60146-2	-	Semiconductor converters - Part 2: Self-commutated semiconductor converters including direct d.c. converters	EN 60146-2	-
IEC 60364-4-41	-	Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock	HD 60364-4-41	-
IEC 60709	-	Nuclear power plants - Instrumentation, control and electrical power systems important to safety - Separation	EN IEC 60709	-
IEC 61000	series	Electromagnetic compatibility (EMC)	EN 61000	series
IEC 61513	-	Nuclear power plants - Instrumentation and control important to safety - General requirements for systems	EN 61513	-
IEC 62003	-	Nuclear power plants - Instrumentation, control and electrical power systems - Requirements for electromagnetic compatibility testing	EN IEC 62003	-
IEC 62040	series	Uninterruptible power systems (UPS)	EN IEC 62040	series
IEC/IEEE 60780-323	-	Nuclear facilities - Electrical equipment important to safety - Qualification	EN 60780-323	-
IEC/IEEE 60980-344	-	Nuclear facilities - Equipment important to safety - Seismic qualification	EN IEC/IEEE 60980-344	-



IEC 61225

Edition 4.0 2025-07

INTERNATIONAL STANDARD

**Nuclear power plants - Instrumentation, control and electrical power systems -
Requirements for static uninterruptible DC and AC power supply systems**

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CONTENTS

FOREWORD	3
INTRODUCTION	5
1 Scope	7
2 Normative references	7
3 Terms and definitions	8
4 Abbreviated terms	10
5 System requirements	10
5.1 General	10
5.2 Function and description	11
5.2.1 Preamble	11
5.2.2 Designations	13
5.2.3 Direct current systems	13
5.2.4 Alternating current systems	13
5.3 System divisions	14
5.4 System boundaries	14
6 Functional requirements for static uninterruptible power supplies	15
6.1 Static uninterruptible power supplies for systems important to safety	15
6.2 Batteries and battery chargers	15
6.3 Inverters and bypass switches	16
6.4 UPS	17
6.5 Converters used for voltage stabilization	18
6.6 I&C power supply using DC/DC converters and AC/DC converters	18
7 Requirements for distribution systems	18
7.1 System aspects	18
7.2 Load allocation	19
7.3 Electrical aspects	21
7.4 Earthing	22
8 Effects of loads on supply quality	22
8.1 General	22
8.2 Electromagnetic interference	22
8.3 Transients	23
8.4 Load current	23
8.5 Power supplies to loads of lower safety classification	23
9 Monitoring and protection	24
9.1 General	24
9.2 Monitoring	24
9.3 Electrical protection	24
10 Qualification of equipment	25
11 Design to cope with ageing	25
12 Testing	26
13 Maintenance	26
Annex A (informative) Examples of voltage input variations	27
Annex B (informative) Examples of specifications	29
B.1 Example 1: Specification for a DC power supply for equipment requiring a non-interruptible supply	29

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B.2	Example 2: Specification for AC power supply for equipment requiring a non-interruptible supply	30
B.3	Example 3: Specification for DC power supply with DC/DC converter for equipment.....	31
B.4	Human factor engineering programme	32
Annex C (normative) Uninterruptible power supplies and distribution systems for power plants with passive design and SMRs		33
C.1	General.....	33
C.2	Recommendations and requirements	34
C.3	Safety assessment.....	34
Bibliography.....		35
Figure 1 – Boundary of a SUPS		12
Figure 2 – Example of one division of a SUPS system		20
Figure 3 – Example of I&C uninterruptible AC power supply system.....		21
Figure A.1 – Example of voltage variations on the on-site AC power system during clearing of a transmission system fault		27
Figure A.2 – Example of on-site voltage profile after loss of load (transfer to house load operation)		27
Figure A.3 – Example of simulated safety bus voltages, double open phase condition in the 400 kV line to the unit transformer		28
Table B.1 – Example 1: Specification for a DC power supply for equipment requiring a non-interruptible supply		29
Table B.2 – Example 2: Specification for AC power supply for equipment requiring a non-interruptible supply		30
Table B.3 – Example 3: Specification for DC power supply with DC/DC converter for equipment.....		31
Table C.1 – Features of electrical power systems that support the different levels of defence in depth as stated in IAEA Safety Standard Series SSR-2/1 (Rev. 1).....		33

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

Nuclear power plants - Instrumentation, control and electrical power systems - Requirements for static uninterruptible DC and AC power supply systems

FOREWORD

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IEC 61225 has been prepared by subcommittee 45A: Instrumentation, control and electrical power systems of nuclear facilities, of IEC technical committee 45: Nuclear instrumentation. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2019. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) expansion and clarification of the requirements for static uninterruptible DC and AC power supply systems to ease the application in SMRs and passive designs.

This International Standard is to be used in conjunction with IEC 61513:2011, IEC 60709:2018, IEC 60880:2006, IEC 62138:2018, IEC 62855:2016 and IEC 63046:2020.

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The text of this International Standard is based on the following documents:

Draft	Report on voting
45A/1591/FDIS	45A/1610/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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INTRODUCTION

a) Technical background, main issues and organization of the standard

The 1993 issue of IEC 61225 was developed for specifying the requirements relevant to the design of electrical supplies for I&C systems in nuclear power plants. Considering the experience gathered worldwide on this subject, in 2003 working group A2 recommended a revision to this document to allow a new revision, IEC 61225 Ed. 2 (2005), to be consistently integrated into the SC 45A standard series. In 2015, working group A11 recommended a revision to this document following the publication of the revision of IAEA SSG-34 and that the scope of the standard should cover static uninterruptible power supplies for all types of connected equipment. In 2022, working group A11 recommended a revision to this document to ease the application to SMRs and passive designs.

International operating experience with electrical supply systems in nuclear power plants has highlighted a number of supply voltage variations and malfunctions, such as:

- voltage perturbations due to disturbances on the internal AC distribution system (with origin off-site or on-site).
- voltage overshoot on loss of grid.
- open phase conditions (one or two phases).
- asymmetrical faults.

These types of perturbations can degrade the performance of static uninterruptible power supplies and ultimately result in failure of connected equipment.

One of the objectives of the uninterruptible power supplies is to protect connected equipment from voltage variations on the on-site AC interruptible distribution system (the immunity concept). The power supplies also guarantee an output voltage with specified magnitude and waveform (in case of AC) to connected loads. The power supplies have the capacity to supply the relevant loads during a specified time regardless of any voltage variations on the on-site AC interruptible distribution system.

Examples of voltage and frequency variations in the incoming feeder to the supplies can be found in informative Annex A. Examples of specifications for static uninterruptible power supplies can be found in informative Annex B. Requirements for SMRs and passive designs are given in Annex C.

This document is applicable to the design of static uninterruptible electrical power supplies in new nuclear power plants (including SMRs and passive designs) when design work is initiated after the publication of this document and in general for nuclear facilities. It also serves as a reference for upgrading and modernizing existing nuclear power plants and facilities.

b) Situation of the current standard in the structure of the SC 45A standard series

IEC 61225 is a second level document specifically addressing the particular topic of requirements for electrical supplies.

For more details on the structure of the SC 45A standard series, see item d) of this introduction.

c) Recommendations and limitations regarding the application of this document

It is important to note that this document establishes no additional functional requirements for safety systems.

To ensure that the standard will continue to be relevant in future years, the emphasis has been placed on issues of principle, rather than specific technologies.