SLOVENSKI STANDARD
SIST EN IEC 61500:2019

01-september-2019

Nadomešča:
SIST EN 61500:2011

Jedrske elektrarne - Merilna in nadzorna oprema za zagotavljanje varnosti - Podatkovne komunikacije v sistemih, ki izvajajo funkcije kategorije A (IEC 61500:2018)

Nuclear power plants - Instrumentation and control systems important to safety - Data communication in systems performing category A functions (IEC 61500:2018)

Kernkraftwerke - Leittechnische Systeme mit sicherheitstechnischer Bedeutung - Datenkommunikation in Systemen, die Funktionen der Kategorie A ausführen (IEC 61500:2018)

Centrales nucléaires de puissance - Systèmes d'instrumentation et de contrôle-commande importants pour la sûreté - Communications de données dans les systèmes réalisant des fonctions de catégorie A (IEC 61500:2018)

Ta slovenski standard je istoveten z: **EN IEC 61500:2019**

ICS:

27.120.20	Jedrske elektrarne. Varnost	Nuclear power plants. Safety

SIST EN IEC 61500:2019 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61500

June 2019

ICS 27.120.20

Supersedes EN 61500:2011

English Version

Nuclear power plants - Instrumentation and control systems important to safety - Data communication in systems performing category A functions (IEC 61500:2018)

Centrales nucléaires de puissance - Systèmes d'instrumentation et de contrôle-commande importants pour la sûreté - Communications de données dans les systèmes réalisant des fonctions de catégorie A (IEC 61500:2018)

Kernkraftwerke - Leittechnische Systeme mit sicherheitstechnischer Bedeutung - Datenkommunikation in Systemen, die Funktionen der Kategorie A ausführen (IEC 61500:2018)

This European Standard was approved by CENELEC on 2019-06-17. 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, 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: Rue de la Science 23, B-1040 Brussels

European foreword

This document (EN IEC 61500:2019) consists of the text of IEC 61500:2018 prepared by IEC/SC 45A: "Instrumentation, control and electrical power systems of nuclear facilities", of IEC/TC 45: "Nuclear instrumentation".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-06-17
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2022-06-17

This document supersedes EN 61500:2011.

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. In a similar manner, this European standard does not prevent Member States from taking more stringent nuclear safety and/or security measures in the subject-matter covered by this standard.

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

Endorsement notice

The text of the International Standard IEC 61500:2018 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 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 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.

Publication	Year	Title	EN/HD	Year
IEC 60671	2007	Nuclear power plants - Instrumentation and control systems important to safety - Surveillance testing	EN 60671	2011
IEC 60709	-	Nuclear power plants - Instrumentation and control systems important to safety - Separation	EN 60709	-
IEC/IEEE 60780-323	2016	Nuclear facilities - Electrical equipment important to safety - Qualification	EN 60780-323	2017
IEC 60880	2006	Nuclear power plants - Instrumentation and control systems important to safety - Software aspects for computer-based systems performing category A functions	EN 60880	2009
IEC 60980	-	Recommended practices for seismic qualification of electrical equipment of the safety system for nuclear generating stations	-	-
IEC 60987	2007	Nuclear power plants - Instrumentation and control important to safety - Hardware design requirements for computer-based systems	EN 60987	2015
+ A1	2013		-	-
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 and control important to safety - Requirements for electromagnetic compatibility testing	-	-
IEC 62340	2007	Nuclear power plants - Instrumentation and control systems important to safety - Requirements for coping with common cause failure (CCF)	EN 62340	2010
IEC 62566	2012	Nuclear power plants - Instrumentation and control important to safety - Development of HDL-programmed integrated circuits for systems performing category A functions	EN 62566	2014
IEC 62645	2014	Nuclear power plants - Instrumentation and control systems – Requirements for security programmes for computer-based systems	-	-

IEC 62859	-	Nuclear power plants - Instrumentation and control systems - Requirements for coordinating safety and cybersecurity	-	-
IAEA safety guide No. SSG-39	2016	Design of instrumentation and control systems for nuclear power plants		

IEC 61500

Edition 3.0 2018-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Nuclear power plants – Instrumentation and control systems important to safety – Data communication in systems performing category A functions

Centrales nucléaires de puissance – Systèmes d'instrumentation et de contrôle-commande importants pour la sûreté – Communications de données dans les systèmes réalisant des fonctions de catégorie A

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 27.120.20

ISBN 978-2-8322-5583-4

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

NUCLEAR POWER PLANTS – INSTRUMENTATION AND CONTROL SYSTEMS IMPORTANT TO SAFETY – DATA COMMUNICATION IN SYSTEMS PERFORMING CATEGORY A FUNCTIONS

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 61500 has been prepared by subcommittee 45A: Instrumentation, control and electrical power systems of nuclear facilities, of IEC technical committee 45: Nuclear instrumentation.

This third edition cancels and replaces the second edition published in 2009. This edition constitutes a technical revision.

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

a) the changes introduced to previously referenced standards have been confirmed to apply;
b) relevant newly published standards have been referenced;
c) lessons learned from several industrial applications have been incorporated.

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

FDIS	Report on voting
45A/1183/FDIS	45A/1194/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.

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

INTRODUCTION

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

The equipment for data communication of on-line plant data can simplify the hardwired cables connecting distributed systems for instrumentation, control, protection and monitoring needed for the safe operation of Nuclear Power Plants (NPP). Such communication systems can have advantages over direct cables, for electrical isolation, for reduction of cable fire loads or other reasons. In a distributed computer based system, communication equipment is an essential part of the system. Data communication is usually essential for implementing I&C systems important to safety in nuclear power plants.

It is intended that the document be used by operators of NPPs (utilities), manufacturers of data communication equipment, systems evaluators and by licensors.

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

IEC 61500 is the third level IEC SC 45A document tackling the generic issue of data communication for equipment performing category A functions.

IEC 61500 is to be read in association with IEC 61513, which is the appropriate IEC SC 45A document providing guidance on general requirements for instrumentation and control systems important to safety, IEC 60880, which is the appropriate IEC SC 45A document providing guidance on software aspects for computer based systems performing category A functions, and IEC 60987 which is the appropriate IEC SC 45A document providing guidance on hardware aspects for computer based systems.

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

c) Recommendations and limitations regarding the application of the standard

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

Aspects for which special recommendations have been provided in this standard are:

- Requirements for data communication within systems performing category A functions.
- Requirements for data communication between divisions of a system performing category A functions.
- Requirements for data communication of systems performing category A functions with systems of lower safety importance.
- Reliability requirements for data communication.

To ensure that the standard will continue to be relevant in future years, emphasis is placed on principles, rather than on specific technologies.

d) Description of the structure of the IEC SC 45A standard series and relationships with other IEC documents and other bodies documents (IAEA, ISO)

The top-level documents of the IEC SC 45A standard series are IEC 61513 and IEC 63046. IEC 61513 provides general requirements for I&C systems and equipment that are used to perform functions important to safety in NPP. IEC 63046 provides general requirements for electrical power systems of NPP; it covers power supply systems including the supply systems of the I&C systems. IEC 61513 and IEC 63046 are to be considered in conjunction and at the same level. IEC 61513 and IEC 63046 structure the IEC SC 45A standard series and shape a complete framework establishing general requirements for instrumentation, control and electrical systems for nuclear power plants.