



SLOVENSKI STANDARD

SIST EN 61839:2014

01-oktober-2014

Jedrske elektrarne - Zasnova prostorov za vodenje - Analiza in dodeljevanje funkcij (IEC 61839:2000)

Nuclear power plants - Design of control rooms - Functional analysis and assignment

Kernkraftwerke - Auslegung von Warten - Analyse und Zuordnung der Funktionen

Centrales nucléaires de puissance - Conception des salles de commande - Analyse fonctionnelle et affectation des fonctions

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Ta slovenski standard je istoveten z: **EN 61839:2014**

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ICS:

25.040.99	Drugi sistemi za avtomatizacijo v industriji	Other industrial automation systems
27.120.20	Jedrske elektrarne. Varnost	Nuclear power plants. Safety

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en

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EUROPEAN STANDARD

EN 61839

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2014

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English Version

Nuclear power plants - Design of control rooms - Functional analysis and assignment (IEC 61839:2000)

Centrales nucléaires de puissance - Conception des salles de commande - Analyse fonctionnelle et affectation des fonctions
(CEI 61839:2000)

Kernkraftwerke - Auslegung von Warten - Analyse und Zuordnung der Funktionen
(IEC 61839:2000)

This European Standard was approved by CENELEC on 2014-08-04. 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.

SIST EN 61839:2014

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, 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

Foreword

This document (EN 61839:2014) consists of the text of IEC 61839:2000 prepared by SC 45A "Instrumentation, control and electrical 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 (dop) 2015-08-04
at national level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting (dow) 2017-08-04
with this document have to be withdrawn

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 measures in the subject-matter covered by this standard.

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Endorsement notice

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The text of the International Standard IEC 61839:2000 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, 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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60964 ¹⁾	1989	Design for control rooms of nuclear power plants	-	-
IEC 61771	1995	Nuclear power plants - Main control-room - Verification and validation of design	-	-

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1) IEC 60964 is superseded by IEC 60964:2009, which is harmonized as EN 60964:2010.

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**NORME
INTERNATIONALE
INTERNATIONAL
STANDARD**

**CEI
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61839

Première édition
First edition
2000-07

**Centrales nucléaires de puissance –
Conception des salles de commande –
Analyse fonctionnelle et affectation des fonctions**

**Nuclear power plants –
Design of control rooms –
Functional analysis and assignment**

SIST EN 61839:2014

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**NUCLEAR POWER PLANTS –
DESIGN OF CONTROL ROOMS –
FUNCTIONAL ANALYSIS AND ASSIGNMENT**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61839 has been prepared by subcommittee 45A: Reactor instrumentation, of IEC technical committee 45: Nuclear instrumentation.

This standard shall be read in conjunction with IEC 60964.

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

FDIS	Report on voting
45A/382/FDIS	45A/389/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 3.

Annexes A and B are for information only.

The committee has decided that the contents of this publication will remain unchanged until 2006. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

NUCLEAR POWER PLANTS – DESIGN OF CONTROL ROOMS – FUNCTIONAL ANALYSIS AND ASSIGNMENT

1 Scope and object

This International Standard specifies functional analysis and assignment procedures (FA and A, sometimes called allocation of functions) for the design of the control-room system for nuclear power plants and gives rules for developing criteria for the assignment of functions.

This standard supplements IEC 60964, which applies to the design of the control-room for nuclear power plants.

The purpose of this standard is to provide specific requirements for carrying out the functional analysis and assignment required in 3.1 and 3.2 of IEC 60964, and therefore supersedes the guidance given in A.3.1 and A.3.2 of IEC 60964.

This standard is applicable to the design of new control-rooms or to backfits (design renewal and design modifications) to existing control-rooms. In the latter case, particular caution is to be exercised to identify areas indirectly affected as well as those directly affected.

2 Normative references (standards.iteh.ai)

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60964:1989, *Design for control rooms of nuclear power plants*

IEC 61771:1995, *Nuclear power plants – Main control-room – Verification and validation of design*

3 Definitions

For the purpose of this International Standard, the definitions given in IEC 60964 and the following definitions apply:

3.1

accident conditions

set of conditions identified in the safety or transient analysis reports and/or in the emergency operating procedures

3.2

functional assignment

distribution of functions among the human and automated constituents of a system

3.3

human machine interface, HMI

interface between operating staff and I and C system and computer systems linked with the plant. The interface includes displays, controls, and the Operator Support System interface (see man/machine interface in IEC 60964)

3.4

probabilistic risk assessment (PRA)

methodological approach to identify accident sequences that can follow from a broad range of initiating events; it includes the systematic and realistic determination of accident frequencies and consequences

3.5

control function

control actions performed by humans or machines for the accomplishment of a functional goal including the associated information acquisition and processing ¹⁾

3.6

tasks

control actions performed by humans for the accomplishment of a functional goal ¹⁾

4 Process of functional analysis and assignment

4.1 General description

The process of functional analysis and assignment is required in clause 3 of IEC 60964 as a first step for the design of a control-room (see figure 1). It aims initially to identify all of the functions required to operate the plant, then to assign the functions to humans or to machines.

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Two basic steps are required:

- a) functional analysis;
- b) assignment of functions.

They are defined respectively in clauses 5 and 6 of this standard.

4.1.1 Functional analysis

The identification of the functions (see 5.2) is obtained initially by defining general or fundamental objectives of the plant operation, i.e. safe and effective generation of electrical power, protection of the public from radiological hazards, then by breaking down the top-level functions, allowing those objectives to be fulfilled, into a hierarchy of functions where the lowest set of functions are the control functions which must then be assigned to humans or to machines. The general nuclear power plant functional analysis is a means to the identification of all the functions achieved from the main control-room.

The static database of functions of different levels, obtained in the previous step, is completed by the determination of the basic operational information flow and processing requirements for plant operation (see 5.3.1).

1) This definition deviates from IEC 60964 but reflects current use.