SLOVENSKI STANDARD
SIST EN IEC 61968-1:2020

01-september-2020

Nadomešča:
SIST EN 61968-1:2013

Združevanje aplikacij pri oskrbi z električno enegijo - Sistemski vmesniki za upravljanje omrežja - 1. del: Arhitektura vmesnikov in splošna priporočila

Application integration at electric utilities - System interfaces for distribution management - Part 1: Interface architecture and general recommendations

Integration von Anwendungen in Anlagen der Elektrizitätsversorgung - Systemschnittstellen für Netzführung - Teil 13: Allgemeine Profile zur Modellierung von Verteilnetzen

Intégration d'applications pour les services électriques - Interfaces système pour la gestion de la distribution - Partie 1: Architecture des interfaces et recommandations générales

Ta slovenski standard je istoveten z: **EN IEC 61968-1:2020**

ICS:

29.240.30	Krmilna oprema za elektroenergetske sisteme	Control equipment for electric power systems
35.200	Vmesniška in povezovalna oprema	Interface and interconnection equipment

SIST EN IEC 61968-1:2020 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61968-1

June 2020

ICS 33.200

Supersedes EN 61968-1:2013 and all of its amendments and corrigenda (if any)

English Version

Application integration at electric utilities - System interfaces for distribution management - Part 1: Interface architecture and general recommendations (IEC 61968-1:2020)

Intégration d'applications pour les services électriques - Interfaces système pour la gestion de la distribution - Partie 1: Architecture des interfaces et recommandations générales
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Integration von Anwendungen in Anlagen der Elektrizitätsversorgung - Systemschnittstellen für Netzführung - Teil 13: Allgemeine Profile zur Modellierung von Verteilnetzen
(IEC 61968-1:2020)

This European Standard was approved by CENELEC on 2020-06-03. 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

Ref. No. EN IEC 61968-1:2020 E

European foreword

The text of document 57/2174/FDIS, future edition 3 of IEC 61968-1, prepared by IEC/TC 57 "Power systems management and associated information exchange" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61968-1:2020.

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) 2021-03-03
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-06-03

This document supersedes EN 61968-1:2013 and all of its amendments and corrigenda (if any).

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 61968-1:2020 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:

IEC 61968-4	NOTE	Harmonized as EN IEC 61968-4
IEC 61968-6	NOTE	Harmonized as EN 61968-6
IEC 61968-8	NOTE	Harmonized as EN 61968-8
IEC 61970-301	NOTE	Harmonized as EN 61970-301
IEC 61970-501	NOTE	Harmonized as EN 61970-501
IEC 61970-552	NOTE	Harmonized as EN 61970-552
IEC 62325 (series)	NOTE	Harmonized as EN IEC 62325 (series)
IEC 62325-301	NOTE	Harmonized as EN IEC 62325-301
IEC 62325-450	NOTE	Harmonized as EN 62325-450
IEC 62325-503	NOTE	Harmonized as EN IEC 62325-503
IEC 62351 (series)	NOTE	Harmonized as EN 62351 (series)
IEC 62361-100	NOTE	Harmonized as EN 62361-100
IEC 62559-2	NOTE	Harmonized as EN 62559-2
ISO 19125 (series)	NOTE	Harmonized as EN ISO 19125 (series)
ISO 19115 (series)	NOTE	Harmonized as EN ISO 19115 (series)

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.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 61968-3	-	Application integration at electric utilities – System interfaces for distribution management – Part 3: Interface for network operations	EN IEC 61968-3	-
IEC 61968-4	-	Application integration at electric utilities - System interfaces for distribution management - Part 4: Interfaces for records and asset management	EN IEC 61968-4	-
IEC 61968-5[1]	-	Application integration at electric utilities - System interfaces for distribution management - Part 5: Distributed energy optimization	EN IEC 61968-5[2]	-
IEC 61968-6	-	Application integration at electric utilities - System interfaces for distribution management - Part 6: Interfaces for maintenance and construction	EN 61968-6	-
IEC 61968-8	-	Application integration at electric utilities - System interfaces for distribution management - Part 8: Interfaces for customer operations	EN 61968-8	-
IEC 61968-9	-	Application integration at electric utilities - System interfaces for distribution management - Part 9: Interfaces for meter reading and control	EN 61968-9	-
IEC 61968-11	-	Application integration at electric utilities - System interfaces for distribution management - Part 11: Common information model (CIM) extensions for distribution	EN 61968-11	-

[1] Under preparation. Stage at the time of publication: IEC/AFDIS 61968-5:2019.

[2] Under preparation. Stage at the time of publication: FprEN IEC 61968-5:2019

Publication	Year	Title	EN/HD	Year
IEC 61968-13	-	Application integration at electric utilities - System interfaces for distribution management - Part 13: CIM RDF Model exchange format for distribution	EN 61968-13	-
IEC 61968-100	-	Application integration at electric utilities - System interfaces for distribution management - Part 100: Implementation profiles	EN 61968-100	-
IEC 62351-11	-	Power systems management and associated information exchange - Data and communications security - Part 11: Security for XML documents	EN 62351-11	-
IEC/TR 62361-103:2018	--	Power systems management and associated information exchange - Interoperability in the long term - Part 103: Standard profiling	-	-

IEC 61968-1

Edition 3.0 2020-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Application integration at electric utilities – System interfaces for distribution management –
Part 1: Interface architecture and general recommendations

Intégration d'applications pour les services électriques – Interfaces système pour la gestion de la distribution –
Partie 1: Architecture des interfaces et recommandations générales

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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APPLICATION INTEGRATION AT ELECTRIC UTILITIES – SYSTEM INTERFACES FOR DISTRIBUTION MANAGEMENT –

Part 1: Interface architecture and general recommendations

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 61968-1 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

This third edition cancels and replaces the second edition published in 2012. This edition constitutes a technical revision.

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

a) update of IRM section, which has been out of date since the 2nd edition;
b) update to IRM model using ArchiMate modelling language;
c) addition of missing business functions and business objects;
d) alignment with newly released documents from the technical committee;
e) alignment with IEC 61968-100;

f) update of annexes.

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

FDIS	Report on voting
57/2174/FDIS	57/2186/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 61968 series, published under the general title *Application integration at electric utilities – System interfaces for distribution management*, 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 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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

IEC 61968 is a series of standards:

IEC 61968 part	Title
1	Interface architecture and general recommendations
2	Glossary
3	Interface for network operation
4	Interface for records and asset management
5	Interface standard for operational planning and optimisation
6	Interface for maintenance and construction
7	Interface standard for network extension planning[1]
8	Interface standard for customer support
9	Interface for meter reading and control
11	Common information model (CIM) extensions for distribution
13	CIM RDF model exchange format for distribution
100	Implementation profiles

The IEC 61968 series is intended to facilitate inter-application integration, as opposed to intra-application integration of the various distributed software application systems supporting the management of utility electrical distribution networks. Intra-application integration is aimed at programs in the same application system, usually communicating with each other using middleware that is embedded in their underlying runtime environment. Additionally, the intra-application integration tends to be optimized for close, real-time, synchronous connections and interactive request/reply or conversation communication models. The IEC 61968 series by contrast, is intended to support the inter-application integration of a utility enterprise that needs to connect disparate applications that are already built or new (legacy or purchased applications) each supported by dissimilar runtime environments. Therefore, the IEC 61968 series is relevant to loosely coupled applications with more heterogeneity in languages, operating systems, protocols, and management tools. The IEC 61968 series is intended to support applications that need to exchange data on an event driven basis. The IEC 61968 series is also intended to be implemented with middleware services that broker messages among applications and complementing, but not replacing, utility data warehouses, database gateways, and operational stores.

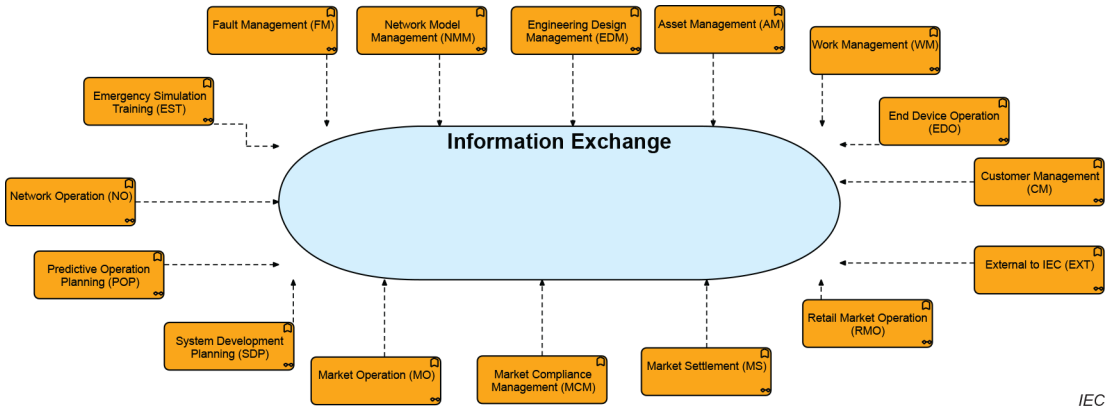

Figure 1 – High-level IEC IRM business functions

[1] Under consideration.

Figure 1 clarifies the scope of IEC IRM in terms of business functions.

As used in the IEC 61968 series, distribution management consists of various distributed application components for the utility to manage electrical distribution networks. These capabilities include monitoring and control of equipment for power delivery, management processes to ensure system reliability, voltage management, demand-side management, outage management, work management, and network model management. The distribution management system could also be integrated with premise area networks (PAN) through an advanced metering infrastructure (AMI) network. Standard interfaces are to be defined for each class of applications identified in Clause 3, Interface Reference Model (IRM), except for those in the group EXT (External to IEC).

In the distribution management domain it is important to keep in mind the basic meaning of the following terms:

- management: effective regulation and direction;
- automation: working without human participation in accordance with pre-defined rule sets;
- system: a set of organized operations working to support a particular activity (set of applications). Generally, a system in the context of this work is a computer-based technology.

In the world of integrated systems, systems can also be a subset of a larger system, a system of systems or a set of federated systems. A system composed of coordinating subsystems may support activities more efficiently than the subsystems operating independently.

As the size of an organisation increases so does the complexity of the tasks and information exchange associated with the tasks. Furthermore, the deeper the data structure is within a system the less transparent it is to the end user. This suggests the need for data stewardship to avoid:

- errors arising from multiple points of data entry;
- lack of consistency with software interfaces;
- expensive changes with new or upgraded software;
- loss of governance of authorised data.

The standardisation of data facilitates the reduction of errors, reduced time for data entry, and improved process control.

The IEC 61968 series recommends that the semantics (domain model) of system interfaces of a compliant utility inter-application infrastructure be defined using Unified Modelling Language (UML).

The Extensible Markup Language (XML) is a data format for structured document interchange, particularly on the Internet. One of its primary uses is information exchange between different and potentially incompatible computer systems. XML is currently recommended to define grammar/syntax for profiles of a compliant utility inter-application infrastructure. A CIM profile, in accordance with IEC TR 62361-103, is derived from the CIM canonical model, which is maintained in the form of a logical information model using UML. Once defined, the profile can be used to generate an associated schema definition, most commonly (but not exclusively) as an XML Schema (XSD) or Resource Description Framework Schema (RDFS). The instance data for given information exchange must then conform to the schema defined for the profile in order to be valid. This can take into account additional restrictions that are defined for the profile over what is defined by the CIM, as almost everything is otherwise optional in the CIM by virtue of its role as a logical information model. Where applicable, IEC 61968-3 to -9 and -13 will define the information recommended for ‘message payloads’. Message payloads will be formatted in accordance with industry requirements and technology development such as XML Schema for IEC 61968-3 to -9 and RDF Schema for IEC 61968-13 with the intent that these payloads can be exchanged using common integration technologies such as SOAP,

JMS, RESTful HTTP, or Web Services (WS). It is the intent of the IEC 61968 series to be leveraged by Service-Oriented Architectures (SOA) and to encourage the usage of Enterprise Service Buses (ESB). In the future, it is possible that payload formats other than XML could be officially adopted by the IEC 61968 series for specific parts or information exchanges.

The organization of IEC 61968-1 is described in Table 1.

Table 1 – Document overview for IEC 61968-1

Clause	Title	Purpose
1.	Scope	Scope of IEC 61968-1.
2.	Normative references	Documents that contain provisions which, through reference in this text, constitute provisions of this International Standard.
3.	Terms and definitions	The terms and definitions relevant to IEC 61968 series is described.
4.	Interface reference model	The domain relevant to IEC 61968 series is described. For each relevant business function, a list of abstract components is provided, which is described by the functions performed by the component. Parts IEC 61968-3 to -9 define interfaces for these abstract components.
5.	Interface profile	Utility inter-application integration environmental requirements are described. Abstract message passing services are defined and are available for applications to communicate information to other applications, including publish and subscribe services.
6.	Information exchange model	Requirements and recommendations are provided for information exchange between applications/functions listed in the IRM.
7.	Component reporting and error handling	Recommendations for audit trails and error message handling authentication necessary to support utility inter-application integration are described.
8.	Security and authentication	Recommendations for security and authentication necessary to support utility inter-application integration are described.
9.	Maintenance aspects	General maintenance recommendations are specified.
Informative Annex A	Use of IEC 61968 series	The methodology used to determine interface architecture recommendations for utility inter-application integration is described.
Informative Annex B	Inter-application integration performance considerations	Some typical performance recommendations necessary to support utility inter-application integration are described. These recommendations are of a general nature as specific implementation requirements will vary by utility.
Informative Annex C	Views of data in a conventional electric utility	This annex describes some of the underlying principles of defining the reference data dictionary of IEC 61968-11.
Informative Annex D	Relevant ArchiMate Definitions for IRM	This annex describes the ArchiMate notations used in the IEC 61968-1 IRM modelling.
Informative Annex E	61968:ED2 Interface profile mapping to ArchiMate	This annex provides the mapping between the 61968-1:2012 ED2 Interface profile and ArchiMate 3.0 from Open Group Standard that is used for this Edition (ED3).