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STN	**Rozhranie aplikačného programu pre systémy riadenia elektrickej energie (EMS-API) Časť 301: Základ všeobecného informačného modelu (CIM)**	**STN EN IEC 61970-301** 33 4621

Energy management system application program interface (EMS-API) - Part 301: Common information model (CIM) base

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 11/20

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61970-301

August 2020

ICS 33.200

Supersedes EN 61970-301:2017 and all of its amendments and corrigenda (if any)

English Version

Energy management system application program interface (EMS-API) - Part 301: Common information model (CIM) base (IEC 61970-301:2020)

Interface de programmation d'application pour système de gestion d'énergie (EMS-API) - Partie 301: Base de modèle d'information commun (CIM)
(IEC 61970-301:2020)

Schnittstelle für Anwendungsprogramme für Netzführungssysteme (EMS-API) - Teil 301: Allgemeines Informationsmodell (CIM), Basismodell
(IEC 61970-301:2020)

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Comité Européen de Normalisation Electrotechnique
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 57/2210/FDIS, future edition 7 of IEC 61970-301, 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 61970-301:2020.

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) 2021-05-01
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-07-31

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61850-7-3	NOTE	Harmonized as EN 61850-7-3
IEC 61968-11:2013	NOTE	Harmonized as EN 61968-11:2013 (not modified)
IEC 61970-501	NOTE	Harmonized as EN 61970-501
IEC 62325 (series)	NOTE	Harmonized as EN IEC 62325 (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 61850	series	Communication networks and systems for power utility automation - Part 10: Conformance testing	EN 61850	series
IEC 61850-7-4	2010	Communication networks and systems for power utility automation - Part 7-4: Basic communication structure - Compatible logical node classes and data object classes	EN 61850-7-4	2010
IEC 61968	series	Application integration at electric utilities - System interfaces for distribution management - Part 1: Interface architecture and general recommendations	EN IEC 61968	series
IEC/TS 61970-2	-	Energy management system application program interface (EMS-API) - Part 2: Glossary	CLC/TS 61970-2	-
UML 2.0 Specification	-	Object Management Group: UML 2.0 Specification	-	-

IEC 61970-301

Edition 7.0 2020-06

INTERNATIONAL STANDARD

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Energy management system application program interface (EMS-API) – Part 301: Common information model (CIM) base

IEC 61970-301:2020-06(en)

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IEC 61970-301

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INTERNATIONAL STANDARD

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ENERGY MANAGEMENT SYSTEM APPLICATION PROGRAM INTERFACE (EMS-API) –

Part 301: Common information model (CIM) base

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 61970-301 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

This seventh edition cancels and replaces the sixth edition, published in 2016. This edition constitutes a technical revision.

This edition reflects the model content version ‘IEC61970CIM17v38’, dated ‘2020-01-21’, and includes the following significant technical changes with respect to the previous edition:

a) Added Feeder modelling;
b) Added ICCP configuration modelling;
c) Correction of issues found in interoperability testing or use of the standard;
d) Improved documentation;
e) Updated Annex A with custom extensions;
f) Added Annex B Examples of PST transformer modelling;

g) Added Annex C HVDC use cases.

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

FDIS	Report on voting
57/2210/FDIS	57/2224/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 of the IEC 61970 series, under the general title: *Energy management system application program interface (EMS-API)*, 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.

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

This document is part of the IEC 61970 series which define an application program interface (API) for an energy management system (EMS). IEC 61970 was originally based upon the work of the EPRI Control Center API (CCAPI) research project (RP-3654-1). The principle objectives of the EPRI CCAPI project were to:

- reduce the cost and time needed to add new applications to an EMS;
- protect the investment of existing applications or systems that are working effectively with an EMS.

The principal objective of the IEC 61970 series is to produce documents which facilitate the integration of EMS applications developed independently by different vendors, between entire EMS systems developed independently, or between an EMS system and other systems concerned with different aspects of power system operations, such as generation or distribution management systems (DMS). This is accomplished by defining application program interfaces to enable these applications or systems access to public data and exchange information independent of how such information is represented internally.

The Common Information Model (CIM) specifies the semantics for this API. The Component Interface Specifications (CIS), which are contained in other parts of the IEC 61970 series, specify the content of the messages exchanged.

The CIM is an abstract model that represents all the major objects in an electric utility enterprise typically needed to model the operational aspects of a utility. This model includes public classes and attributes for these objects, as well as the relationships between them.

This document defines the CIM Base set of packages which provide a logical view of the functional aspects of an Energy Management System including Supervisory Control and Data Acquisition (SCADA). Other functional areas are standardized in separate IEC documents that augment and reference this document. For example, IEC 61968-11 addresses distribution models and references this document. While there are multiple IEC standards dealing with different parts of the CIM, there is a single, unified information model comprising the CIM behind all these individual standards documents.

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning a computer-based implementation of an object-oriented power system model in a relational database. As such, it does not conflict with the development of any logical power system model including the Common Information Model (CIM), where implementation of the model is not defined.

The IEC takes no position concerning the evidence, validity and scope of this patent right.

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ENERGY MANAGEMENT SYSTEM APPLICATION PROGRAM INTERFACE (EMS-API) –

Part 301: Common information model (CIM) base

1 Scope

The common information model (CIM) is an abstract model that represents all the major objects in an electric utility enterprise typically involved in utility operations. By providing a standard way of representing power system resources as object classes and attributes, along with their relationships, the CIM facilitates the integration and interoperability of network applications developed independently by different vendors, between entire systems running network applications developed independently, or between a system running network applications and other systems concerned with different aspects of power system operations, such as generation or distribution management. SCADA is modelled to the extent necessary to support power system simulation and inter-control centre communication. The CIM facilitates integration by defining a common language (i.e. semantics) based on the CIM to enable these applications or systems to access public data and exchange information independent of how such information is represented internally.

The object classes represented in the CIM are abstract in nature and can be used in a wide variety of applications. The use of the CIM goes far beyond its application in an EMS. This document should be understood as a tool to enable integration in any domain where a common power system model is needed to facilitate interoperability and plug compatibility between applications and systems independent of any particular implementation.

Due to the size of the complete CIM, the object classes contained in the CIM are grouped into several logical Packages, each of which represents a certain part of the overall power system being modelled. Collections of these Packages are progressed as separate International Standards. This document specifies a Base set of packages which provide a logical view of the functional aspects of Energy Management System (EMS) and power system modelling information within the electric utility enterprise that is shared between all applications. Other standards specify more specific parts of the model that are needed by only certain applications. Subclause 4.3 of this document provides the current grouping of packages into standards documents.

2 Normative references

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.

IEC 61850 (all parts), *Communication networks and systems for power utility automation*

IEC 61850-7-4:2010, *Communication networks and systems for power utility automation – Part 7-4: Basic communication structure – Compatible logical node classes and data object classes*

IEC 61968 (all parts), *Application integration at electric utilities – System interfaces for distribution management*

IEC TS 61970-2, *Energy management system application program interface (EMS-API) – Part 2: Glossary*

Object Management Group: *UML 2.0 Specification* – http://www.omg.org