Energy management system application program interface (EMS-API) - Part 302: Common information model (CIM) dynamics

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NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 61970-302:2018 sisaldab Euroopa standardi EN IEC 61970-302:2018 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 61970-302:2018 consists of the English text of the European standard EN IEC 61970-302:2018.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 08.06.2018.	Date of Availability of the European standard is 08.06.2018.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

Energy management system application program interface (EMS-API) - Part 302: Common information model (CIM) dynamics (IEC 61970-302:2018)

Interface de programmation d'application pour système de gestion d'énergie (EMS-API) - Partie 302: Régimes dynamiques de modèle d'information commun (CIM) (IEC 61970-302:2018)

Schnittstelle für Anwendungsprotokolle für Energieverwaltungssysteme (EMS-API) - Teil 302: Allgemeines Informationsmodell (CIM) Dynamik (IEC 61970-302:2018)

This European Standard was approved by CENELEC on 2018-05-17. 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.

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

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European foreword

The text of document 57/1954/FDIS, future edition 1 of IEC 61970-302, 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 61970-302:2018.

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)	2019-02-17
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2021-05-17

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This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

Endorsement notice

The text of the International Standard IEC 61970-302:2018 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 61400-27-1:2015	NOTE	Harmonized as EN 61400-27-1:2015 (not modified).
IEC 61970-501:2006	NOTE	Harmonized as EN 61970-501:2006 (not modified).

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 60050	series	International electrotechnical vocabulary	-	-
IEC 61970-301	-	Energy Management System Application Program Interface (EMS-API) - Part 301: Common information model (CIM) base	EN 61970-301	-
IEC/TS 61970-2	-	Energy management system application program interface (EMS-API) - Part 2: Glossary	CLC/TS 61970-2	-

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INTRODUCTION

This International Standard is one of the IEC 61970 series which defines an application program interface (API) for an energy management system (EMS).

The principal objective of the IEC 61970 series is to produce standards that facilitate the integration of EMS applications developed independently by different vendors, between entire EMSs developed independently, or between an EMS 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 standards, 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.

IEC 61970-301 defines the CIM Base set of packages which provide a logical view of the functional aspects of an energy management system.

This part of the standard, IEC 61970-302, builds on IEC 61970-301 and provides the specifications for the exchange models representing dynamic behaviour of the majority of power system components in common use today by utilities to perform system simulation studies for system dynamic assessment and for planning purposes.

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

Part 302: Common information model (CIM) dynamics

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 of energy management system (EMS) applications developed independently by different vendors, between entire EMSs developed independently, or between an EMS 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 communication between control centres. 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.

Due to the size of the complete CIM, the object classes contained in the CIM are grouped into a number of logical packages, each of which represents a certain part of the overall power system being modelled. Collections of these packages are being developed as separate International Standards.

This particular document specifies a Dynamics package which contains extensions to the CIM to support the exchange of models between software applications that perform analysis of the steady-state stability (small-signal stability) or transient stability of a power system as defined by IEEE / CIGRE *Definition and classification of power system stability IEEE/CIGRE joint task force on stability terms and definitions*.

The model descriptions in this standard provide specifications for each type of dynamic model as well as the information that needs to be included in dynamic case exchanges between planning/study applications.

The scope of the CIM extensions specified in this standard includes:

- standard models: a simplified approach to describing dynamic models, where models representing dynamic behaviour of elements of the power system are contained in predefined libraries of classes which are interconnected in a standard manner. Only the names of the selected elements of the models along with their attributes are needed to describe dynamic behaviour.
- proprietary user-defined models: an approach providing users the ability to define the parameters of a dynamic behaviour model representing a vendor or user proprietary device where an explicit description of the model is not provided by the standard. The same libraries and standard interconnections are used for both proprietary user-defined models and standard models. The behavioural details of the model are not documented in the standard, only the model parameters.

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 60050 (all parts), *International Electrotechnical Vocabulary*

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

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

3 Terms and definitions

For the purposes of this document, the terms and definitions contained in IEC 60050 (for general glossary), IEC 61970-2 (for EMS-API glossary definitions) and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
application program interface
API
set of public functions provided by an executable application component for use by other executable application components

3.2
common information model
CIM
abstract model that represents all the major objects in an electric utility enterprise typically contained in an EMS information model

Note 1 to entry: By providing a standard way of representing power system resources as object classes and attributes, along with their relationships, the CIM facilitates the integration of EMS applications developed independently by different vendors, between entire EMSs developed independently, or between an EMS and other systems concerned with different aspects of power system operations, such as generation or distribution management.

3.3
CIMXML
serialisation format for exchange of XML data as defined in this document

3.4
Document Object Model
DOM
platform- and language-neutral interface defined by the World Wide Web Consortium (W3C) that allows programs and scripts to dynamically access and exchange the content, structure and style of documents

3.5
document type definition
DTD
specific document for describing the vocabulary and syntax associated with an XML document

Note 1 to entry: XML Schema and RDF are other forms that can be used.