



BSI Standards Publication

Energy management system application program interface (EMS-API)

Part 600-1: Common Grid Model Exchange Specification
(CGMES) – Structure and rules

National foreword

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**Energy management system application program interface (EMS-API) –
Part 600-1: Common Grid Model Exchange Specification (CGMES) – Structure
and rules**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references	9
3 Terms, definitions and abbreviated terms	9
3.1 Terms and definitions.....	10
3.2 Abbreviated terms.....	10
4 Exchange process	11
5 Specifications and functionalities	13
5.1 General constraints.....	13
5.2 Model authority sets (MAS).....	14
5.3 File header	15
5.4 File body.....	16
5.5 Profiles and instance file types.....	17
5.5.1 General	17
5.5.2 CGMES profiles' properties	17
5.5.3 CGMES' extensions	19
5.5.4 Equipment profile and instance file	22
5.5.5 Topology profile and instance file	22
5.5.6 Steady state hypothesis profile and instance file.....	22
5.5.7 State variables profile and instance file	22
5.5.8 Boundary equipment profile and instance file.....	23
5.5.9 Boundary topology profile and instance file.....	23
5.5.10 Diagram layout profile and instance file	23
5.5.11 Geographical location profile and instance file	24
5.6 File exchange	25
5.7 Boundary point – properties and location	26
5.8 Model assembling process	28
5.9 RDF/XML model validity.....	30
5.10 Naming Convention.....	30
6 CGMES governance	34
6.1 General.....	34
6.2 Versions of the CGMES and the profiles	34
6.3 Conformity assessment.....	35
6.4 Implementation process	36
Annex A (normative) Template for further restrictions on naming	37
Annex B (normative) Summary of specific rules for naming conventions	38
B.1 IdentifiedObject.name	38
B.2 IdentifiedObject.description.....	38
B.3 IdentifiedObject.energyIdentCodeEic	38
B.4 IdentifiedObject.shortName.....	38
B.5 ConnectivityNode and TopologicalNode .fromEndIsoCode	38
B.6 ConnectivityNode and TopologicalNode .toEndIsoCode	39
B.7 ConnectivityNode and TopologicalNode .fromEndName	39
B.8 ConnectivityNode and TopologicalNode .toEndName	39
B.9 ConnectivityNode and TopologicalNode .fromEndNameTso	39

B.10	ConnectivityNode and TopologicalNode .toEndNameTso	40
B.11	Future developments on CIM for dynamics	40
Annex C	(normative) File header guidelines	41
C.1	General	41
C.2	Exchange scenarios	41
C.3	Examples	42
C.3.1	Example 1: File header of full model	42
C.3.2	Example 2: File header of full model that is depending on another model	43
C.3.3	Example 3: File header of full model that is depending on a model and supersedes another model	44
C.3.4	Example 4: File header of difference model that is depending on a full model and supersedes another full model	45
C.3.5	Example 5: File header of difference model that is depending on a difference model and supersedes another difference model	46
Annex D	(normative) PST transformer modelling	48
D.1	General	48
D.2	Mapping to CIM classes and attributes	48
D.3	Reactance formulas summary table	49
D.4	Symmetrical Phase shifters	50
D.4.1	Single phase diagram and equations	50
D.4.2	Expression of the angle and ratio per tap	51
D.4.3	Expression of the equivalent series reactance given the angle	51
D.4.4	Three-phase diagrams	52
D.5	Quadrature booster	53
D.5.1	Single phase diagram and equations	53
D.5.2	Expression of the angle and ratio per tap	53
D.5.3	Expression of the equivalent series reactance given the angle	54
D.5.4	Three-phase diagrams	54
D.6	Asymmetrical Phase Shifter	55
D.6.1	Single phase diagram and equations	55
D.6.2	Expression of the angle and ratio per tap	55
D.6.3	Expression of the equivalent series reactance given the angle	55
D.6.4	Three-phase diagram	56
D.7	In-phase transformer and symmetrical phase shifter	56
D.7.1	Single phase diagram and equations	56
D.7.2	Expression of the angle and ratio per tap	57
D.7.3	Expression of the equivalent series reactance given the angle and the in-phase transformer ratio	57
D.8	In-phase transformer and asymmetrical phase shifter	58
D.8.1	Single phase diagram and equations	58
D.8.2	Expression of the equivalent series reactance given the angle and the in-phase transformer ratio	58
D.8.3	Technology principles	59
D.9	Detailed calculations and examples	59
D.9.1	Symmetrical phase shifters with two cores	59
D.9.2	Quadrature boosters	63
D.9.3	Asymmetrical phase shifter	67
Annex E	(normative) Implementation guide	74
E.1	General	74

E.2	TapChanger.neutralU vs PowerTransformerEnd.ratedU vs. VoltageLevel.BaseVoltage	74
E.2.1	Issue description	74
E.2.2	Required implementation	75
E.3	Angle of PhaseTapChangerTaple Point.....	75
E.4	Slack generator.....	75
E.5	qPercent SynchronousMachine	76
E.6	TopologicalIsland.....	76
E.7	Implementation of SSH and SV profiles.....	76
E.8	Ground voltage levels	76
E.9	LTCflag.....	76
E.9.1	Issue description	76
E.9.2	Use cases.....	77
E.9.3	Required implementation	78
E.10	ACLineSegment-s between different terminal voltages.....	79
E.10.1	Issue description	79
E.10.2	Required implementation	79
E.11	Association from ConformLoadGroup/NonConformLoadGroup	80
E.11.1	Issue description	80
E.11.2	Required implementation	80
E.12	Regulating control.....	81
E.13	Implementation of the GeographicalRegion and SubGeographicalRegion	81
E.14	Implementation of GeneratingUnit.normalPF	81
E.15	Implementation of Power Transformer.....	82
E.16	Interpretation of parameters of PowerTransformerEnd	82
E.17	Implementation of Switch	82
E.18	UnitMultiplier.....	83
E.19	EnergySource: “voltageMagnitude” and “voltageAngle”	83
Annex F (normative)	CGMES profiles versions.....	84
Bibliography	85
Figure 1	– Dependencies between the profiles belonging to CGMES	19
Figure 2	– Boundary point placed on a tie-line	26
Figure 3	– Boundary point placed in a substation	26
Figure 4	– HVDC as interconnection or internal line	27
Figure 5	– HVDC grid.....	27
Figure 6	– Assembly process	29
Figure 7	– Main development stages of the CGMES	34
Figure C.1	– Example work flow events.....	41
Figure D.1	– Single phase diagram, phasor diagram and equations	51
Figure D.2	– Example for symmetrical double core phase shifter	52
Figure D.3	– Dual core and single core	52
Figure D.4	– Single core, delta hexagonal.....	53
Figure D.5	– Single phase diagram, phasor diagram and equations	53
Figure D.6	– Dual core and single core	54
Figure D.7	– Single phase diagram, phasor diagram and equations	55
Figure D.8	– Dual core.....	56

Figure D.9 – Single phase diagram, phasor diagram and equations	57
Figure D.10 – Single phase diagram, phasor diagram and equations	58
Figure D.11 – In-phase regulating auto-transformer	59
Figure D.12 – Symmetrical phase shifters with two cores	60
Figure D.13 – Detailed three phase diagram	60
Figure D.14 – Detailed three phase diagram	63
Figure D.15 – Single phase diagram	64
Figure D.16 – Phasor diagram	65
Figure D.17 – Detailed three phase diagram	66
Figure D.18 – Phasor diagram	67
Figure D.19 – Asymmetrical phase shifter with two cores	67
Figure D.20 – Detailed three phase diagram	68
Figure D.21 – Phasor diagram	69
Figure D.22 – Asymmetrical phase shifter with a single core	70
Figure D.23 – Phasor diagram	71
Figure D.24 – Example of detailed three-phase diagram of voltage regulating auto-transformer and quadrature booster	72
Figure D.25 – Example of detailed winding diagram of voltage regulating auto-transformer and quadrature booster	73
Figure E.1 – Diagram ConformLoadGroup/NonConformLoadGroup	80
Figure E.2 – Regulating control setup	81
Figure E.3 – Power transformer modelling	82
Table 1 – IdentifiedObject attributes	33
Table 2 – IdentifiedObject attributes for ConnectivityNode in EQ_BD profile and for TopologicalNode in TP_BD profile	33
Table D.1 – Mapping of phase shift transformers to CIM classes	48
Table D.2 – Mapping of symbols used in formulas to CIM attributes	49
Table D.3 – Impedance variations in a phase shift transformer	50
Table D.4 – Description of variables	50
Table E.1 – Meaning of the combinations for TapChanger.TapChangerControl and TapChanger.ItcaFlag	79

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ENERGY MANAGEMENT SYSTEM APPLICATION
PROGRAM INTERFACE (EMS-API) –****Part 600-1: Common Grid Model Exchange Specification
(CGMES) – Structure and rules**

FOREWORD

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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 61970-600-1, which is a technical specification, has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
57/1815/DTS	57/1871/RVDTS

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 61970 series, published 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 document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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

A bilingual version of this publication may be issued at a later date.

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INTRODUCTION

The purpose of the Common Grid Model Exchange Specification (CGMES) is to define the interface between Transmission System Operators (TSO) software in order to exchange power system modelling information as required by the European Network of Transmission System Operators for Electricity (ENTSO-E) and TSO business processes.

The CGMES is used as a baseline exchange specification for the implementation of the Common Grid Model (CGM) methodologies in accordance with the requirements for the implementation of various European network codes and guidelines. The CGMES applies to applications dealing with power system data management, as well as applications supporting the following analyses:

- load flow and contingency analyses,
- short circuit calculations,
- market information and transparency,
- capacity calculation for capacity allocation and congestion management, and
- dynamic security assessment.

The conformity of the applications used for operational and system development exchanges with the CGMES is crucial for the needed interoperability of these applications. ENTSO-E therefore developed and approved the CGMES Conformity Assessment Framework as the guiding principles for assessing applications' CGMES conformity. This technical specification relies on the CGMES Conformity Assessment Process operated by ENTSO-E in order to ensure that the CGMES is properly implemented by suppliers of the applications used by TSOs.

The CGMES is a superset of the former ENTSO-E CIM based data exchange standard (Profile 1) which was based on CIM14 (UML14v02) and has been used for certain network models exchanges since 2009. The CGMES reflects TSO requirements (as known by 2014) for accurate modelling of the ENTSO-E area for power flow, short circuit, and dynamics applications whilst also allowing for the exchange of any diagram layouts including GIS data of a grid model.

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

Part 600-1: Common Grid Model Exchange Specification (CGMES) – Structure and rules

1 Scope

This technical specification on the CGMES defines the main rules and requirements related to the CGMES which are mandatory for achieving interoperability with the CGMES and for satisfying business processes. In this document requirements are indicated as such in a tabular format. Some descriptions are merely used for clarification and are marked “Informational”.

The profiles which belong to CGMES are defined in IEC 61970-600-2:2017. The related technical information and documentation (i.e. RDFS, OCL, XMI and HTML) needed for the implementation of the CGMES, which is not copyrighted by either IEC or CENELEC, is available at the ENTSO-E web site.

The CGMES is defined using information on the Common Information Model (CIM) available in the public domain.

Future editions of this technical specification will be released to describe following CGMES versions which will reflect additional requirements due to European network codes or guidelines.

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 61970-452, *Energy management system application program interface (EMS-API) – Part 452: CIM model exchange specification*

IEC 61970-453, *Energy management system application program interface (EMS-API) – Part 453: Diagram layout profile*

IEC 61970-456, *Energy management system application program interface (EMS-API) – Part 456: Solved power system state profiles*

IEC 61970-552, *Energy management system application program interface (EMS-API) – Part 552: CIMXML Model exchange format*

IEC 61968-4, *Application integration at electric utilities – System interfaces for distribution management – Part 4: Interfaces for records and asset management*

3 Terms, definitions and abbreviated terms

For the purposes of this document, the following terms, definitions and abbreviated terms apply.