

# INTERNATIONAL STANDARD

## AMENDMENT 1

### Energy management system application program interface (EMS-API) – Part 456: Solved power system state profiles

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## FOREWORD

This amendment has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

IEC 61970-456:2013 is based on IEC 61970-301 Edition 4 (2013). Both are based on the 61970 UML version CIM14. The amendment is based on IEC 61970-301 Edition 5 (2013) and the 61970 UML version CIM15.

For the Topology profile this amendment includes the following changes with respect to the previous edition:

- a) The classes Name and NameType classes have been added.
- b) The class TopologicalNode has been extended with the role ConnectivityNodeContainer.
- c) The attribute IdentifiedObject.description has been removed.

For the StateVariables profile this edition includes the following changes with respect to the previous edition:

- a) The role TopologicalIsland.TopologicalNodes has been replaced by TopologicalNode.TopologicalIsland.
- b) The documentation of attributes SvPowerFlow.p and SvPowerFlow.q has been updated.
- c) The attribute SvShuntCompensatorSections.sections has been changed from Integer to Float.
- d) The attribute SvShuntCompensatorSections.continuousSections is removed.
- e) The attribute SvTapStep.position is changed from Integer to Float.
- f) The attribute SvTapStep.continuousPosition is removed.
- g) The attribute SvVoltage.angle is changed from radians to degrees.
- h) The data types have been elaborated.

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

FDIS	Report on voting
57/1591/FDIS	57/1620/RVD

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

The committee has decided that the contents of this amendment and the base 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- withdrawn,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.

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

### 3 Profile information

Replace, in the first paragraph, “UML version CIM14v14” by “UML version CIM15v33”.

Replace the existing Table 1 by the following new Table 1.

Name	Version	URI	Revision date
Topology	2	<a href="http://iec.ch/TC57/2011/61970-456/Topology/CIM15/2">http://iec.ch/TC57/2011/61970-456/Topology/CIM15/2</a>	2011-09-09
StateVariables	2	<a href="http://iec.ch/TC57/2011/61970-456/StateVariables/CIM15/2">http://iec.ch/TC57/2011/61970-456/StateVariables/CIM15/2</a>	2011-09-09

## 9 Topology profile

### 9.1 General

Remove the second paragraph: “Profile namespace: <http://iec.ch/TC57/61970-456/Topology/CIM14/1#>”.

### 9.2.2 TopologicalNode

Add the following row at the end of the table “Native members”:

ConnectivityNodeContainer	1..1	ConnectivityNodeContainer	The connectivity node container to which the topological node belongs.
---------------------------	------	---------------------------	--

Remove the first row “description” from the table “Inherited members”.

Add the following new Subclauses 9.2.3 and 9.2.4 after Subclause 9.2.2:

### 9.2.3 Name

Core package

The Name class provides the means to define any number of human readable names for an object. A name is not to be used for defining inter-object relationships. For inter-object relationships instead use the object identification 'mRID'.

#### Native members

name	1..1	string	Any free text that names the object.
IdentifiedObject	1..1	<u>IdentifiedObject</u>	Identified object that this name designates.
NameType	1..1	<u>NameType</u>	Type of this name.

### 9.2.4 NameType

Core package

Type of name. Possible values for attribute 'name' are implementation dependent but standard profiles may specify types. An enterprise may have multiple IT systems each having its own local name for the same object, e.g. a planning system may have different names from an EMS. An object may also have different names within the same IT system, e.g. localName and aliasName as defined in CIM version 14. Their definitions from CIM14 are as follows:

The localName is a human readable name of the object. It is only used with objects organized in a naming hierarchy. localName: A free text name local to a node in a naming hierarchy similar to a file directory structure. A power system related naming hierarchy may be: Substation, VoltageLevel, Equipment etc. Children of the same parent in such a hierarchy have names that typically are unique among them.

aliasName: A free text alternate name typically used in tabular reports where the column width is limited.

### 9.3 Abstract classes – IdentifiedObject

*Remove the first row “description” from the table “Native members”.*

#### 10.1 General

*Remove the second paragraph “Profile namespace: <http://iec.ch/TC57/61970-456/StateVariables/CIM14/1#>”.*

#### 10.2.1 TopologicalIsland

*Remove the second row “TopologicalNodes” from the table “Native members”.*

*Remove the first row “description” from the table “Inherited members”.*

#### 10.2.3 SvPowerFlow

*Replace the existing text in the first row “p”, fourth column in the table “Native members” by the following new text:*

The active power flow. Load sign convention is used, i.e. positive sign means flow out from a node.

*Replace the existing text in the second row “q”, fourth column in the table “Native members” by the following new text:*

The reactive power flow. Load sign convention is used, i.e. positive sign means flow out from a node.

#### 10.2.5 SvShuntCompensatorSections

*Remove the first row “continuousSections” from the table “Native members”.*

*Replace the existing text in the second row “sections”, third column in the table “Native members” with the following new text:*

float

#### 10.2.6 SvTapStep

*Remove the first row “continuousPosition” from the table “Native members”.*

*Replace the existing text in the second row “position”, third column in the table “Native members” with the following new text:*

float

### 10.2.7 SvVoltage

Replace the existing text in the first row “angle”, third column in the table “Native members” with the following next text:

AngleDegrees

Add the following new Subclause 10.2.8 after Subclause 10.2.7:

### 10.2.8 TopologicalNode

Topology Package

For documentation of TopologicalNode refer to 9.2.2.

Native Members

TopologicalIsland	1..1	TopologicalIsland	A topological node belongs to a topological island.
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Replace the existing text of 10.3.2 to 10.3.6 with the following new text:

### 10.3.2 ActivePower

Product of RMS value of the voltage and the RMS value of the in-phase component of the current

Native attributes

Value (Float)

Units (UnitSymbol=W)

Multiplier (UnitMultiplier=M)

### 10.3.3 AngleDegrees

Measurement of angle in degrees.

Native attributes

Value (Float)

units (UnitSymbol=deg)

multiplier (UnitMultiplier=none)

### 10.3.4 ApparentPower

Product of the RMS value of the voltage and the RMS value of the current

Native attributes

Value (Float)

Units (UnitSymbol=VA)

Multiplier (UnitMultiplier=M)

### 10.3.5 ReactivePower

Product of RMS value of the voltage and the RMS value of the quadrature component of the current.

Native attributes

value (Float)

unit (UnitSymbol=Var)

multiplier (UnitMultiplier=M)

### 10.3.6 Voltage

Electrical voltage.

Native attributes

Value (Float)

Units (UnitSymbol=V)

Multiplier (UnitMultiplier=k)

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