

## WG13 Issues - CIM18 Release Notes (Aggregate Report)

#	Priority	Subject	Completion Date	Solution Version	Breaking Change	Breaking Change Description
6282	High	Update of the 302 and 457 inconsistencies and gaps	03/04/2023	CIM18v04	No	

### Release Notes

All changes below are applied in 61970-302 and 61970-457

GovCIGREGT and GovIEEEGT1

change type and description of attribute fx - boolean

add a1 to a5 attributes, temperature and initialTemperature, pmax

For TurbCIGREHRSGST and TurbIEEEGenericHRSGST: add 6 points pgt and qg. Attribute pdtqg is deleted

add 6 pairs (f1-f6, y1-y6) to represent the output of the block over frequency/under frequency control

delete pred attribute

TurbIEEEHydroWCNonLinear

deleted attribute gpm

added 6 pairs of attributes g1-g6, pm1-pm6

ExclIEEEAC8B

added the statement "However this model is not supporting this, hence the model AC8C from IEEE 421.5-2016, 7.17 (ExclIEEEAC8C) should be used."

ExclIEEEST6B

added the statement "This model is not supporting Vb signal in a correct way, hence the model ST6C from IEEE 421.5-2016, 8.13 (ExclIEEEST6C) should be used."

OverexcLimIEEEOEL2C, OverexcLimIEEEOEL3C, OverexcLimIEEEOEL5C

added attribute inputSignalKind and enumeration OverExcitationLimiterInputKind

GovSteamFV4

Update the diagram of GovSteamFV4 to include parameter Sf1

add the following note to the diagram

"The characteristic using Kf1, Sf1 and alpha has the following details:

$E_{cf} = 1 - \Omega$

If  $abs(E_{cf}) < Sf1$  :

$C_{pfc} = 0$

else:

$C_{pfc} = Kf1 * (abs(E_{cf}) - Sf1)$

If  $C_{pfc} > Lps$

$C_{pfc} = Lps$

If  $C_{pfc} < Lpi$

$C_{pfc} = Lpi$

where Kf1 is the slope of the characteristic; Alpha is the angle of the slope used only for diagram explanation and the deadband is Sf1."

added attribute sf1

#	Priority	Subject	Completion Date	Solution Version	Breaking Change	Breaking Change Description
6274	Normal	Remove ACDCTerminal.connected	03/21/2023	CIM18v04	Yes	Removal of attribute. Considerations will need to be some when modelling open ended branches.

#### Release Notes

The following changes were applied:

- Remove ACDCTerminal.connected from SSH profile. The following classes were deleted: ACDCTerminal, DCBaseTerminal, Terminal, DCTerminal, ACDCCConverterDCTerminal
- deprecate ACDCTerminal.connected in 61970-301.
- add the following text in 301 under a new section

#### 4.6.18 Modelling of open ended branch

This document deprecates the attribute ACDCTerminal.connected as additional attributes were added and modelling concepts aligned. ConductingEquipment-s can be put in service using the attribute Equipment.inService that specifies the availability of the equipment for topology processing, which determines if the equipment is energized or not. Usage of switching equipment is the preferred approach. In order to cover use cases where modelling of open ended branch for pure bus branch models, it is recommended that export at least one of the switches of the branch so that fault studies or other studies can perform the necessary simulations. Some studies may require modelling a fault in detail and this may require using Cut and Jumper classes to for instance to a model the detail location of the Cut.

- in 456 delete the following statement and refer to the section 4.6.18 in 301

"Opening of an ACLineSegment end can be made by using the ACDCTerminal.connected flag. In this case a TopologicalNode at the open ACLineSegment end is needed. This is made to describe a fault case."

6251	Normal	Modify TC57CIM package name and description	04/26/2023	CIM18v04	No	
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#### Release Notes

The top package was renamed to CIM.

5946	High	Association Terminal.TopologicalNode	02/19/2023	CIM18v04	Yes	Removing required association in TP profile and making other associations in TP and EQ required
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#### Release Notes

The following changes are applied:

in the Topology profile (to be published in 61970-456)

- remove association Terminal.TopologicalNode
- remove association DCBaseTerminal.DCTopologicalNode (note the association DCNode to DCTopologicalNode is already required association)
- delete classes Terminal, ACDCTerminal, DCBaseTerminal, ACDCCConverterDCTerminal, DCTerminal as they are no longer needed in the profile after removal of the associations.
- a diagram in 456 is updated

in the Equipment profile (to be published in 61970-452)

- change cardinality of association Terminal.ConnectivityNode from 0..1 to 1. This is necessary because since CIM17 the models are build on the basis of ConnectivityNode for both node breaker and bus branch modelling styles.
- change the cardinality of the DCBaseTerminal.DCNode from 0..1 to 1. This will match the way it is done for AC part.
- the following rule was updated

R:452:ALL:ConductingEquipment:connectivity

All subtypes of ConductingEquipment are required to have associations to Terminals. The number of associated Terminals is specified in IEC 61970-301 in section 4.8.2 "Number of terminals for ConductingEquipment objects."

5099	High	Not possible to properly model variable shunt reactor	02/19/2023	CIM18v04	No	
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**Release Notes**

The class VariableShuntCompensator is added in Wires package. The class inherits from NonlinearShuntCompensator.

The description of the class is:

A variable shunt compensator (VSR) is an oil-filled reactor with discrete on-line regulation of reactive power. The regulation range typically varies between 30% and 100% of the rated reactive power. When energized VSR cannot have a reactive output of 0 Mvar, so minimal valid section number is 1 with reactive power output at either 100% or at minimal reactive power output. Note that reactive power can increase or decrease with increasing of the section number (NonlinearShuntCompensatorPoint.sectionNumber).

The class is also added to EQ profile in -452 and SSH profile in -456.

5011	High	The 61970 452 profile and 456 profile both contain the same	02/27/2023	CIM18v04	No	
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**Release Notes**

CIM16 issues were already closed in CIM17.

Existing attributes that have "normal" are well described.

Moving forward, the following principle will be applied. It is not desirable to add a "normal" attribute in addition to an attribute added in the SSH profile to provide a state for power flow. This can be done through the use of a default SSH or a pattern. For instance, if there's a normal quantity that changes and is different for each scenario, then we don't really have a "normal" quantity. Only when in all scenarios we have "normal" quantity, it makes sense to have "normal" attribute.

4926	High	TapChangerKind and TransformerControlMode should be dropped	03/04/2023	CIM18v04	No	
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**Release Notes**

Both the RatioTapChanger.tcuControlMode attribute and the corresponding TransformerControlMode enumeration have been removed. These have been deprecated since the CIM16 release and were not part of published profiles for CIM17. The RegulatingControl.mode should be used instead.

4917	High	Documentation of LoadResponseCharacteristic exponents Sugg	02/19/2023	CIM18v04	No	
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**Release Notes**

The description of LoadResponseCharacteristic was updated with

$$pInjection = Pnominal * (Frequency / (Nominal frequency))^{cim:LoadResponseCharacteristic.pFrequencyExponent}$$

$$qInjection = Qnominal * (Frequency / (Nominal frequency))^{cim:LoadResponseCharacteristic.qFrequencyExponent}$$

Note that both voltage and frequency exponents could be used together so the full equation would be:

$$pInjection = Pnominal * (Voltage / (cim:BaseVoltage.nominalVoltage))^{cim:LoadResponseCharacteristic.pVoltageExponent} * (Frequency / (base frequency))^{cim:LoadResponseCharacteristic.pFrequencyExponent}$$

$$qInjection = Qnominal * (Voltage / (cim:BaseVoltage.nominalVoltage))^{cim:LoadResponseCharacteristic.qVoltageExponent} * (Frequency / (base frequency))^{cim:LoadResponseCharacteristic.qFrequencyExponent}$$

The voltage and frequency expressed in the equation are values obtained from solved power flow. Base voltage and base frequency are those derived from the connectivity of the static network model.

6260	Normal	Associations not conforming to modeling rules	02/11/2023	CIM18v03	No	
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<b>Release Notes</b>						
The following association ends were updated to start with capital OTHER_CIM [1..1] SimulationResultCharacteristic.Y1valueSignal OTHER_CIM [0..1] SimulationResultCharacteristic.Y3valueSignal OTHER_CIM [0..1] SimulationResultCharacteristic.Y2valueSignal						
6259	Normal	Misplaced association description	02/11/2023	CIM18v03	No	
<b>Release Notes</b>						
Moded the association PerLengthLineParameter.WireAssemblyInfo description to the association end description						
New description is A WireAssemblyInfo used to compute the PerLengthParameter data in the Wires package.						
6258	Normal	Mass datatype is wrongly refereing to g instead of kg		CIM18v03	No	
<b>Release Notes</b>						
CIMDatatype Mass was corrected from multiplier =k to none, unit from =g to kg This is necessary to match with the UnitSymbol						
6257	High	ShuntCompensatorDynamics missing description	02/11/2023	CIM18v03	No	
<b>Release Notes</b>						
The folowing description added to the class Shunt compensator whose behaviour is described by reference to a standard model or by definition of a user-defined model.						
6254	Normal	Rename the IEC61970 top level package to Grid as well as all references to IEC61970 within the CIM	02/11/2023	CIM18v03	No	
<b>Release Notes</b>						
The existing IEC61970 package has been renamed to 'Grid' The IEC61970CIMVersion class was renamed to 'GridCIMVersion' References to WG13 were either removed or changed to UTF13 (i.e. the acronym for UCAlug Task Force 13) where/when relevant. There were other references within various descriptions of classes/attributes/packages to remove references to IEC where relevant.						
6253	Normal	Updates of Dynamics package	02/06/2023	CIM18v03	No	
<b>Release Notes</b>						
Number of issues found in an implementation of the draft 302 and 457. Changes enable more flexibility of the detailed model.						
6252	Normal	Modify URI of the packages under Dynamics package	02/06/2023	CIM18v03	No	
<b>Release Notes</b>						
Each subpackage of package Dynamics is uniquely identified by its URI. The URI changes if there is a change in the classes included in this package. The latest version of the URI are in the UML and in the 61970-302 and in 61970-457. Adjustment were made in order to have the URI resolvable.						
6250	Normal	Update of CIM namespace	02/06/2023	CIM18v03	No	
<b>Release Notes</b>						
The namespace is changed in the WG13 version of CIM18v03. CMM will formalise this in the merged version. The nsuri tag value on the TC57CIM package was modified.						
5945	High	DCSwitch does not have open flag	02/06/2023	CIM18v03	No	

<b>Release Notes</b>						
The class DCSwitch is updated to include 4 attributes: open, normalOpen, locked, retained in order to match the modelling of teh AC Switch.						
5357	Normal	Documentation on ShuntCompensator.grounded and EnergyConsumer.grounded attributes	02/07/2023	CIM18v03	No	
<b>Release Notes</b>						
The descriptions are changed as follows ShuntCompensator.grounded "Required for Yn and I connections (as represented by ShuntCompensator.phaseConnection). True if the neutral is solidly grounded." EnergyConsumer.grounded "Required for Yn and I connections (as represented by EnergyConsumer.phaseConnection). True if the neutral is solidly grounded."						
5339	High	Copyright statement to be included in the 301 template	02/06/2023	CIM18v03	No	
<b>Release Notes</b>						
Following the agreement by WG13 on 61970-302. The same statements were applied to 61970-301 template, v02 here: <a href="http://iectc57.ucaiug.org/WG13/Shared%20Documents/61970%20Work%20in%20progress;%20models,%20documents%20and%20issues/CIM18/301%20Ed8/template_iec61970-301-Ed8-v02.docx">http://iectc57.ucaiug.org/WG13/Shared%20Documents/61970%20Work%20in%20progress;%20models,%20documents%20and%20issues/CIM18/301%20Ed8/template_iec61970-301-Ed8-v02.docx</a>						
5304	Normal	Clarify description on TransformerEnd attributes	02/11/2023	CIM18v03	No	
<b>Release Notes</b>						
The following changes are applied						
<ul style="list-style-type: none"> <li>- Changed the description of TransformerEnd.grounded to: Used only for Yn and Zn connections indicated by PowerTransformerEnd.connectionKind. If true, the neutral is grounded and attributes TransformerEnd.rground and TransformerEnd.xground are required. If false, the attributes TransformerEnd.rground and TransformerEnd.xground are not considered.</li> <li>- Changed the description of TransformerEnd.rground to: Resistance part of neutral impedance. Zero indicates solidly grounded or grounded through a reactor.</li> <li>- Changed the description of TransformerEnd.xground to: Reactance part of neutral impedance. Zero indicates solidly grounded or grounded through a reactor.</li> </ul>						
the template of 452 is updated - the 452 constraint C:452:SC:PowerTransformerEnd.grounded:grounding is deleted as the constraint is integrated in teh description. In the template of 452 there is an action item to update SHACL constraints.						
5113	Normal	NonlinearShuntCompensator has ambiguity in definition of per section or total	02/11/2023	CIM18v03	Yes	Some attributes were renamed.
<b>Release Notes</b>						
Applied the following changes Change to the NonlinearShuntCompensatorPoint: b is replaced with bTotal: Total positive sequence shunt (charging) susceptance at section noted by sectionNumber. b0 is replaced with b0Total: Total zero sequence shunt (charging) susceptance at section noted by sectionNumber. g is replaced with gTotal: Total positive sequence shunt (charging) conductance at section noted by sectionNumber. g0 is replaced with g0Total: Total zero sequence shunt (charging) conductance at section noted by sectionNumber.						
Modified the description of the NonlinearShuntCompensator to refere to the new attributes						
Applied similar changes to the NonlinearShuntCompensatorPhase and NonlinearShuntCompensatorPhasePoint as well						
Modified EQ and SC profiles in 61970-452.						
5111	Normal	Versioning of CIM packages	02/11/2023	CIM18v03	No	
<b>Release Notes</b>						
Two tag values were added to the UML						

uri which has the URI of the package, e.g. <http://ucaiu.org/CIM/Dynamics/1.0>  
 version which is the version of the package, e.g. 1.0.0

5108	Normal	PowerTransformerEnd	02/11/2023	CIM18v03	No	
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**Release Notes**

Part of the description of PowerTransformerEnd ws updated to  
 1) two PowerTransformerEnd-s shall be defined for a two Terminal PowerTransformer even if the two PowerTransformerEnd-s have the same rated voltage. The high voltage PowerTransformerEnd (TransformerEnd.endNumber=1) is the one used to exchange resistances (r, r0) and reactances (x, x0) of the PowerTransformer while the low voltage PowerTransformerEnd (TransformerEnd.endNumber=2) shall have zero impedance values.

5047	Normal	Clarifications on equivalents, e.g., EquivalentInjection, ExternalNetworkInjections and the aggregate attribute	02/11/2023	CIM18v03	No	
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**Release Notes**

- Added the following clarification to the EquivalentInjection description  
 Using EquivalentInjection to model a distribution network equivalent is recommended practice instead of using ExternalNetworkInjection-s if it is not necessary that the equivalent contains detailed information representing a short circuit equivalent according to IEC 60909 which is relevant for short circuit studies.

- Added the following clarification to the ExternalNetworkInjection description  
 It is only used if EquivalentInjection cannot provide the details required by IEC 60909 on short circuit equivalent of an external network.

- Modified the following statement in the Equipment.aggregate to include ExternalNetworkInjection. The revised version is:  
 The attribute is not used for EquivalentBranch, EquivalentShunt, EquivalentInjection and ExternalNetworkInjection.

- Deleted the folling constraint from 452  
 • C:452:EQ:EquivalentInjection:instance  
 Using EquivalentInjection to model a distribution network equivalent is recommended practice instead of using ExternalNetworkInjection-s.

5045	High	Voltage-dependent reactive capability curve support	02/07/2023	CIM18v03	Yes	There are changes to association end names and cardinalities. Due to association directions changes might also be seen as not breaking.
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**Release Notes**

changes to 301  
 - new attribute ReactiveCapabilityCurve.referenceVoltage  
 - change of cardinalities between ReactiveCapabilityCurve and EquivalentInjection  
 - modifications of associations between ReactiveCapabilityCurve and SynchronousMachine (change role name InitiallyUsedBySynchronousMachines to InitiallyUsedBySynchronousMachine; change role name ReactiveCapabilityCurves to ReactiveCapabilityCurve and SynchronousMachines to SynchronousMachine; change of cardinalities)  
 - modified the association role description (SynchronousMachine.InitialReactiveCapabilityCurve) to add: The reference voltage (exchnaged by ReactiveCapabilityCurve.referenceVoltage) for this ReactiveCapabilityCurve shall be equal to the BaseVoltage.nominalVoltage of the ConnectivityNode to which the Equipment is connected to. The information is obtained via the containment of the Equipment or the ConnectivityNode.  
 - Change role name from VsConverterDCSides to VsConverter, change cardinalities  
 - Add referenceVoltage to VsCapabilityCurve

Changes to 452

- added attribute ReactiveCapabilityCurve.referenceVoltage
- added attribute ReactiveCapabilityCurve.coolantTemperature
- added attribute ReactiveCapabilityCurve.hydrogenPressure
- change of cardinalities between ReactiveCapabilityCurve and EquivalentInjection
- change of cardinalities and role names between ReactiveCapabilityCurve and EquivalentInjection and SynchronousMachine
- add constraint: Constraint 1: A ReactiveCapabilityCurve shall have an instance of either ReactiveCapabilityCurve.SynchronousMachine or ReactiveCapabilityCurve.EquivalentInjection.
- Add referenceVoltage to VsCapabilityCurve, update association cardinalities and role names

- The constraint C:452:EQ:SynchronousMachine:reactiveLimits shall be changed to:

ReactiveCapabilityCurve-s are not required if the reactive power limits of the SynchronousMachine do not vary with real power output. SynchronousMachine.minQ and SynchronousMachine.maxQ are required if ReactiveCapabilityCurve.SynchronousMachine and SynchronousMachine.InitialReactiveCapabilityCurve are not provided. If one or many of the association ends ReactiveCapabilityCurve.SynchronousMachine and/or SynchronousMachine.InitialReactiveCapabilityCurve are provided they take precedence to the information provided by the attributes SynchronousMachine.minQ and SynchronousMachine.maxQ. However, if both SynchronousMachine.minQ, SynchronousMachine.maxQ and ReactiveCapabilityCurve are present, the SynchronousMachine.minQ shall be equal to the min of CurveData.y1 value-s and SynchronousMachine.maxQ shall be equal to the max of CurveData.y2value-s.

New constraint

If a ReactiveCapabilityCurve is provided for a SynchronousMachine, it takes precedence to the information provided by the attributes GeneratingUnit.maxOperatingP and GeneratingUnit.minOperatingP. Any operational constraints are defined by range constraint exchanged in other profile which defines these operational constraints. Validation of this constraint shall have severity "Info" in case GeneratingUnit.maxOperatingP and GeneratingUnit.minOperatingP are outside the ReactiveCapabilityCurve defined for the nominal voltage of the connected node.

5006	High	Overlap between transformer xMin and xThe TransformerEnd.x	02/07/2023	CIM18v03	No	
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**Release Notes**

The following deprecated attributes are deleted in Base package and in 61970-452:

- PhaseTapChangerLinear.xMin
- PhaseTapChangerNonLinear.xMin

5004	High	Short circuit data for power electronicsCurrently PowerEle	02/11/2023	CIM18v03	No	
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**Release Notes**

The following deprecated attributes are removed

- PowerElectronicsConnection.x
- PowerElectronicsConnection.r
- PowerElectronicsConnection.x0
- PowerElectronicsConnection.r0
- PowerElectronicsConnection.xn
- PowerElectronicsConnection.rn

The change is not considered a breaking change because attributes were deprecated in previous release. Changes does not impact 61970-452 and 61970-600 as these attributes were not included in CIM17 profile standards.

5384	Normal	Update all UML diagrams to include the UCAIug "used with permission" notice	06/17/2022	CIM18v02	No	
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**Release Notes**

The "Reproduced with the permission of UCAIug" notification was applied to all UML diagrams within the IEC61970 package and its sub-packages.

5383	Normal	CIM18 merge official Dynamics package changes corresponding to IEC 61970-457 Ed 2.0 and IEC 61970-302 Ed 2.0 published standards.	06/17/2022	CIM18v02	No	
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<b>Release Notes</b>						
The latest Dynamics package that aligns with the newly published <b>IEC 61970-457 Ed 2.0</b> and <b>IEC 61970-302 Ed 2.0</b> standards has been merged into the IEC61970 package.						
5285	Normal	Addition of value3 attributes in BasicIntervalSchedule and RegularTimePoint (possibly IrregularTimePoint as well to be consistent?)	06/21/2022	CIM18v02	No	
<b>Release Notes</b>						
A third set of value related attributes have been added to the <b>BasicIntervalSchedule</b> , <b>RegularTimePoint</b> , and <b>IrregularTimePoint</b> classes where applicable. The specific changes included:						
<b>BasicIntervalSchedule.value3Multiplier</b> (UnitMultiplier)						
<b>BasicIntervalSchedule.value3Unit</b> (UnitSymbol)						
<b>BasicIntervalSchedule.value3Description</b> (String)						
<b>RegularTimePoint.value3</b> (Float)						
<b>IrregularTimePoint.value3</b> (Float)						
5151	Normal	Addition of value description attributes to BasicIntervalSchedule class.	06/21/2022	CIM18v02	No	
<b>Release Notes</b>						
The following two attributes have been added to the <b>BasicIntervalSchedule</b> class:						
<b>BasicIntervalSchedule.value1Description</b> (String) "Description for value1."						
<b>BasicIntervalSchedule.value2Description</b> (String) "Description for value2."						
5107	Normal	New Names proposal - inverted associations	10/19/2021	CIM18v01	No	
<b>Release Notes</b>						
After applying the new Names proposal to the CIM18v00 release it was discovered that two associations had their source and target specifications (and descriptions) reversed. This has been corrected in the CIM18v01 release.						
5067	High	Remove out of date Dataset and Profile UML	09/28/2021	CIM18v01	No	
<b>Release Notes</b>						
The following association and attribute updates were applied to the <b>Dataset</b> related classes within the <b>GenericDataseSet</b> package:						
<ul style="list-style-type: none"> <li>Removed the <b>Dataset-Profile</b> role</li> <li>Removed the <b>Profile</b> class from the diagram.</li> <li>Removed the <b>Dataset.name</b> and <b>Dataset.description</b> attributes.</li> <li>A new <b>Part303</b> package was introduced under the top level <b>IEC61970</b> package and is a peer package to <b>Base</b>. Subsequently the <b>GenericDataSet</b> package was moved to this new location. This reorg is beneficial to better represent the future IEC61970-303 publication as separate and distinct from Base (i.e. IEC61970-301)</li> </ul>						
5066	Normal	Address issues with the Names classes construct introduced as of CIM15	08/06/2021	CIM18v00	Yes	NameTypeAuthority class was removed and association role ends renamed.
<b>Release Notes</b>						
The following changes were applied to CIM18 to address insufficiency in the existing Names construct in the 61970 package:						
<ul style="list-style-type: none"> <li>Add a new association i.e. <b>Name (0..n) --&gt; IdentifiedObject (0..1)</b> to handle alternative identifiers distinct and different from alternate names (i.e using the existing associatoin).</li> <li>Added a new class <b>ObjectType</b> to the Core package</li> </ul>						



1. Added attribute **type** to the **ObjectType** class
2. Added a new association **ObjectType (0..1) --> IdentifiedObject (0..n)**

- Added a new class **NamingAuthority** to replace **NameTypeAuthority** which was also deleted (a breaking change).
  1. Add **description** , **mRID** , and **name** attributes to this new class
  2. Added a new association **NameType (0..n) --> NamingAuthority (0..1)**
  3. Added a new association **Name (0..n) --> NamingAuthority (0..1)**
- Added the following attributes to existing classes:
  1. Added **language** and **mRID** attributes to the existing **Name** class
  2. Added **mRID** attribute to the **NameType** class
- Added a new association between the existing **Name** and **IdentifiedObject** classes with the following role end names and cardinality:
  1. **AlternativeIdentifier (0..n) --> UniqueIdentifiedObject (0..1)**
- Renamed the role end name for the existing **Name --> IdentifiedObject** associations. Changed it from it's plural form (i.e. Names) to its singular form. This to conform with formal CIM modeling guidelines

5065	Normal	The CIM definition for the Analog.positiveFlowIn attribute should be aligned with the more semantically pure definition being proposed for IEC 61850	06/30/2021	CIM18v00	No	
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#### Release Notes

The CIM definition for the **Analog.positiveFlowIn** attribute should be aligned with the more semantically pure definition being proposed for IEC 61850. This request was part of IEC 61850 harmonization recommendations (Recommendation R16).

5064	Normal	Update the description on the PhaseCode and SinglePhaseCode classes to better clarify balanced and unbalanced usages.	06/30/2021	CIM18v00	No	
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#### Release Notes

The descriptions of **PhaseCode** and **SinglePhaseKind** enumerations were updated as part of IEC 61850 harmonization recommendations (Recommendation R10). This to better clarify their use for balanced and unbalanced models.

5061	Normal	Address issues and clarity around the Control.controlType description	08/24/2020	CIM18v00	No	
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#### Release Notes

The description of **Control.controlType** was:

“Specifies the type of Control, e.g. BreakerOn/Off, GeneratorVoltageSetPoint, TieLineFlow etc. The ControlType.name shall be unique among all specified types and describe the type.”

This has now been changed to:

“Specifies the type of Control. For example, this specifies if the Control represents BreakerOpen, BreakerClose, GeneratorVoltageSetPoint, GeneratorRaise, GeneratorLower, etc.”.

This was performed to align the description with the approach as expressed in Measurement.measurementType as we cannot have ControlType.name as mentioned in the original.

5059	Normal	The description of Terminal.phases refers to GroundSwitch,	08/24/2020	CIM18v00	No	
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#### Release Notes

The description of **Terminal.phases** refers to GroundSwitch which is not a class in the CIM. This reference has been removed.

#	Priority	Subject	Completion Date	Solution Version	Breaking Change	Breaking Change Description
5057	Normal	The description for ShuntCompensator has an error that must be corrected.	07/01/2020	CIM18v00	No	
<b>Release Notes</b> Addressed an error in the description of <b>ShuntCompensator</b> . Changed the sentence:  "A negative value for ReactivePerSection indicates that the compensator is a reactor."  to:  "A negative value for bPerSection indicates that the compensator is a reactor."						
5055	High	The TapChangerControl class has a cardinality issue with the RegulatingControl.RegulatingCondEq association.	06/30/2020	CIM18v00	No	
<b>Release Notes</b> It was discovered in the published release of IEC 61970-301 Ed. 7.0 that the <b>TapChangerControl</b> class had an issue in the cardinality of the <b>RegulatingControl.RegulatingCondEq</b> association inherited from <b>RegulatingControl</b> . The cardinality on the association was changed from "0..n" to "1..n" sometime after CIM17v34. A country comment during CDV of IEC 61970-452 (for CIM17) exposed an issue with this. The "1..n" cardinality imposes a requirement that an instance of a <b>TapChangerControl</b> must reference at least one instance of a <b>RegulatingCondEq</b> class type via the <b>RegulatingCondEq.RegulatingControl</b> association. This requirement could not be fulfilled for <b>TapChangerControls</b> and thus had to be rolled back resulting in the need for an amendment to IEC 61970-301 Ed. 7.0. Consequently, the "reverting" of this cardinality back to "0..n" needed to occur in both CIM17 for the amendment and in CIM18 under development. This issue (i.e. 5055) is to track this change.						
5053	Normal	Add explanatory text to show the differences between BusbarSection and Junction	06/30/2021	CIM18v00	No	
<b>Release Notes</b> Per an IEC 61850 harmonization recommendation (Recommendation R4) the CIM classes <b>BusbarSection</b> and <b>Junction</b> descriptions were updated. From a topology processing point of view the two classes are equivalent. In addition, <b>ConnectivityNodes</b> can be defined with or without associations to instances of these classes. IEC 61970-301 does not give clear guidance on when it would be appropriate for <b>ConnectivityNodes</b> to be associated with <b>BusbarSections</b> , <b>Junctions</b> or neither. This makes it difficult to define rules for automatic conversion from IEC 61850 SCL files. Section 4.5.4 in the standard has also been updated to better clarify.						
5052	Normal	Typographical errors needing correction in CIM18	06/16/2020	CIM18v00	No	
<b>Release Notes</b> Minor typographical updates to descriptions of <b>OperatingParticipant</b> , <b>IdentifiedObject.aliasName</b> , <b>CurveData.xvalue</b> , <b>BaseVoltage</b> , and <b>BasicIntervalSchedule</b> .						
5051	Normal	The description on the WaveTrap class is incorrect.	06/15/2020	CIM18v00	No	
<b>Release Notes</b> The description on the <b>WaveTrap</b> class was incorrect. The description states:  "Line traps are devices that impede high frequency power line carrier signals yet present a negligible impedance at the main power frequency."  "Line traps" was replaced with "Wave Traps"						
5050	Normal	Description updates needed for the association between TopologicalNode and BusNameMarker.	06/15/2020	CIM18v00	No	
<b>Release Notes</b> Corrected minor typos and wording issues discovered in the <b>BusNameMarker</b> role end description for the association between <b>TopologicalNode</b> and <b>BusNameMarker</b> . Updated the role end						

to read:

“A user defined topological node that was originally defined in a planning model not yet having topology described by ConnectivityNodes. Once ConnectivityNodes have been created they may be linked to user defined TopologicalNodes using BusNameMarkers.”

5046	Normal	Remove deprecated attributes from ShuntCompensator and Switch classes	08/06/2021	CIM18v00	Yes	Existing attributes that were declared deprecated in CIM17 have been removed
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**Release Notes**

The attributes **switchOnCount** and **switchOnDate** on the **ShuntCompensator** and **Switch** classes were flagged as deprecated in CIM17 and were removed now from CIM18. It was confirmed that these attributes are not in use in the IEC 61970-45x series standards nor in the IEC 61968 Part 3-9 series of standards.