WG13 Issues - CIM18 Release Notes (Aggregate Report)

#	Priority	Subject	Completion Date	Solution Version	Breaking Change	Breaking Change Description
7105	Immediate	ICCPConfiguration packaged dependency as wrong dependency	01/22/2025	CIM18v15	No	
Release Notes						
Dependency of ICCPConfiguration package is changed from Core to SCADA package.						
7070	Normal	Special characters in the UnitSymbol	12/05/2024	CIM18v14	No	
Release Notes						
Special characters were fixed in the Base package						
6811	Normal	Clean up Equivalent modelling descriptions and classnames	11/18/2024	CIM18v14	Yes	Class names will be changed
Release Notes						
Changed description of classes according to v3 of the attached document Changes are applied to: ExternalNetworkInjection and attributes ikSecond, maxInitialSymShCCurrent, maxQ, maxR0ToX0Ratio, maxR1ToX1Ratio,maxZ0ToZ1Ratio , minInitialSymShCCurrent, minQ, minR0ToX0Ratio, minR1ToX1Ratio, voltageFactor, minZ0ToZ1Ratio EquivalentInjection and the attributes: maxQ, minQ, ExtendedWardEquivalent - attributes r, r0, r2, x, x0, x2.						
6808	Normal	Determine if we can have BusbarSection and Junction on a single ConnectivityNode	09/09/2024	CIM18v12	No	
Release Notes						
The description of BusbarSection was changed to "A conductor, or group of conductors, with negligible impedance, that serve to connect other conducting equipment within a single substation. The BusbarSection class is intended to represent physical parts of bus bars no matter how that bus bar is constructed. Voltage measurements are typically obtained from voltage transformers that are connected to busbar sections. A bus bar section may have many physical terminals but for analysis is modelled with exactly one logical terminal." The description of Junction was changed to "A point where one or more conducting equipments are connected with zero resistance. The Junction class is intended to provide a place to associate additional information to a connectivity node which connects two or more equipment terminals. Examples include a tee-point or the connection point between two switches. The Junction class is intended to provide a method to associate additional information, for instance Location, to a ConnectivityNode. Examples include a T-point or the connection point between two switches. Typically, BusbarSection objects and Junction objects are represented by different symbols on diagrams."						
6802	High	Identity class	06/05/2024	CIM18v11	Yes	Due to change of the inheritance structure
Release Notes						
The following changes are applied: new class Identity class with description: “This is a root class to provide common identification for all classes.” attribute Identity.identifier with description: “A universally unique object identifier. Used to uniquely identify persistent objects between CIM messages.”						

UUID class with description: “A UUID as defined by IEC/ISO 9348-8”
IdentifiedObject must be updated as its description currently states it is a “root class”. This is no longer the case. The new description is: “This is a class that provides common identification for all classes needing identification and naming attributes.”
IdentifiedObject inherits from Identity

6786	Normal	Add clarification that BaseVoltage.nominalVoltage is line-to-line	06/05/2024	CIM18v11	No	

Release Notes

- the description of BaseVoltage class was changed to "Defines a system base voltage which is referenced. This may be different than the rated voltage."
- the description to BaseVoltage.nominalVoltage was changed to "The power system resource's base voltage, expressed on a phase-to-phase (line-to-line) basis. Shall be a positive value and not zero."

6785	Normal	Modelling of Ward and Extended Ward Equivalent by EquivalentInjection	06/04/2024	CIM18v11	Yes	Attributes are moved

Release Notes

The following classes were added WardEquivalent ExtendedWardEquivalent
The ExtendedWardEquivalent has r, x, and the regulating status and voltage attributes all required attributes in the profile. The attributes are moved from EquivalentInjection.
ExtendedWardEquivalent gets r0, r2, x0, x2 as part of the SC profiles
EquivalentInjection is abstract in the profile
The association with ReactiveCapabilityCurve is moved to ExtendedWardequivalent
Attribute regulationCapability is deleted as ExtendedWardEquivalent always has the capability to regulate. The regulationStatus is kept for SSH usage to have the ability to deactivate the voltage control although this is also questionable as this will turn the Extended ward to a ward.

Changes are applied in EQ, SC and SSH profiles.

6758	High	Measurement issues		CIM18v13		

Release Notes

452 fixed - added UnitSymbol.none for Analog in the constraint C:452:OP:Measurement.unitSymbol:analogValues and in table 3

6713	Normal	Update namespace and profile from http to https		CIM18v13		
6693	High	new disclaimer note on every Inf* UML diagram indicating to “use at your own risk”	02/04/2024	CIM18v10	No	

Release Notes

The following disclaimer is added to every Inf* UML diagram the package and Notes for each Inf* package.

Disclaimer:

All informative UML modelling that is contained within the Informative packages (packages beginning with Inf*) is considered work under development and is subject to change or removal at any time. Therefore, this content should be used at your own risk. Users are encouraged to participate in and/or submit use cases to the respective UCA Task Force for additions and/or features not yet covered by the CIM.

6635	Normal	Add URI as a domain primitive	02/28/2024	CIM18v10		

Release Notes

Added new datatype, the primitive URI with the following description "Uniform Resource Identifier Reference (URI). The value can be absolute or relative, and may have an optional fragment identifier (i.e., it may be a URI Reference). This type should be used to specify the intention that the value fulfills the role of a URI as defined by [RFC 2396], as amended by [RFC 2732]."

6632	Normal	update definition of deprecated	09/04/2024	CIM18v12	No	

Release Notes

The following text was added in the 61970-301 Ed8.

"The CIM model may at times contain packages, classes, attributes, or associations that have been identified as deprecated. These items will be noted in the documentation or with a UML stereotype of “deprecated”. A deprecated item is retained in the present version of the model but is expected to be removed from future versions. An item can be removed without being tagged as deprecated in a previous version. One reason for deprecating a class, attribute or association rather than removing it, could be to allow for the use of the item a new version of an existing profile that is updated with non-breaking changes. New profile should not use any deprecated items."

6615	High	Add CIMDatatype MassPerLength and Force	02/04/2024	CIM18v10	No	

Release Notes

- Added <CIMDatatype>MassPerLength, Note: Mass per length. It shall be a positive value or zero.
unit:InitalValue: kgPerm
- Note the multiplier of the datatype is set to none
- added new UnitSymbol kgPerm with the note "Mass per length in kilogram/metres (kg/m). Note: multiplier “k” is included in this unit symbol for compatibility with mass datatype."
- added <CIMDatatype>Force Note: Force in newtons. It shall be a positive value or zero.
unit:InitalValue: N

6612	Urgent	Missing association in Dynamics package	11/28/2023	CIM18v09	No	

Release Notes

Changes in Dynamics package in IEC 61970-302 and in the DY profile in IEC 61970-457
- StatorCurrentLimiterDynamics.ExcitationSystemDynamics association added with cardinality 0..1 and 1..1

6599	High	Exchange of solution for DC and modifications to DCTerminal	02/04/2024	CIM18v10	No	

Release Notes

- Added SvDCPowerFlow that inherits from StateVariable (description: State variable for power flow. Load convention is used for flow direction. This means flow out from the DCTopologicalNode into the equipment is positive.)
the class has attribute .p with description: The active power flow. Load sign convention is used, i.e. positive sign means flow out from a DCTopologicalNode (bus) into the conducting equipment.
- added association between DCTerminal and SvDCPowerFlow
- Added class SvDCVoltage that inherits from StateVariable and has association with DCTopologicalNode. The description is: State variable for direct current voltage.
- Added SvDCVoltage.v with description State variable for direct current voltage
- added DCTerminal.polarity with datatype enumeration DCTerminalPolatityKind (positive and negative)

Profile changes
- 61970-452 - DCTerminal.polarity added as optional attribute in EQ profile
- 61970-456 - SvDCVoltage and SvDCPowerFlow added to SV profile
- 61970 -452 - Add the following constraint
C:452:EQ:DCTerminal:polarity
If a DC system contains VsConverter the attribute DCTerminal.polarity is required for all DCTerminal within the DC system.

6563	Normal	Updates are required across the Grid package to evaluate references to HVDC and updated to DC for use in the context of DERs.	02/04/2024	CIM18v10	No	

Release Notes

The following descriptions were updated: CsPpccControlKind, CsOperatingModeKind, DCConverterOperatingModeKind, DCLine, ACDCConverter.ratedUdc, VsPpccControlKind.pPccAndUdcDroopPilot, DCConverterUnit.operationMode.

#	Priority	Subject	Completion Date	Solution Version	Breaking Change	Breaking Change Description
6548	High	European extensions introduced in CIM17v40 are not compliant to the CIM Modelling Guidelines document.	10/23/2023	CIM18v08	Yes	Deletion of European specific classes and migrating of attributes across classes. See release notes for details.

Release Notes

- moved package DocExtIEC61970 from EuropeanExtensions to InfGrid package
- applied European extensions to Identified object - 2 attributes stereotyped with European
- moved the class BoundaryPoint to Base->Core and added the class in the main diagram in Core
- moved kind attribute to OperationalLimitType
- moved enum LimitKind to OperationalLimits package and added it to the diagram
- moved SolarPowerPlant and WindPowerPlant to Production package and added them to the diagram
- deleted EuropeanExtensions package
- updated GridCIMVersion

6476	Urgent	302,457 Duplicated attributes	07/12/2023	CIM18v06	No	

Release Notes

The following changes are applied in 302 and 457
ExcIEEEST4C kpr - delete the duplicate
WeccREECD iqfrz - delete the duplicate
WeccREPCC qmax - rename to pmax to match with the description of the attribute
ExcIEEEST4C kir - delete the duplicate

6462	Normal	Integrate ENTSO-E extensions, profiles and proposal of protection from Takashi	07/02/2023	CIM18v05	No	

Release Notes

The following changes are included in the 18v05
- in the InfGrid the following packaged were deleted: EnergyArea, InfAvailabilityPlans, InfSIPS, InfOperationalLimits
- added InfENTSOEextensionsNetworkCodes in InfGrid
- added EuropeanExtensions package to Grid package. These are extensions already published in IEC 61970-301 Ed 7.1
- added InfProtectionControlExtentions package that contains extenstions from Takashi in InfGrid

6461	Normal	302,457 issue PowerFlowSettings missing 3 attributes	07/02/2023	CIM18v05	No	

Release Notes

The following attributes are added to 302 and 457 as required attributes in simulation settings profile
- maxIterationsInnerLoop, integer, Description: Maximum iterations of the power flow calculation algorithm inner loop.
- maxIterationsOuterLoop, integer, Description: Maximum iterations of the power flow calculation algorithm outer loop. This can refer to the maximum number of iterations when area interchange control is performed as part of an outer loop or when specific control actions are done in the outer loop.
- loadResponseCharacteristicsEnabled, boolean, Description: True means load response characteristics are considered, if present in the model. False, means that even if enabled, the load response characteristics are not taken into account by the power flow calculation algorithm.

6460	Normal	302, 457 issue Point of Connection	07/01/2023	CIM18v05	No	

Release Notes

The following changes are applied to 302 and 457:
- add required association WindPlantDynamics.PointOfConnection between WindPlantDynamics and Termnal

6459	Normal	302, 457 issue with “triple” association of WindPlantControlCommIEC.CommunicationIEC	07/01/2023	CIM18v05	No	

Release Notes

The following changes are applied to 302 and 457:
- Added the following associations between WindPlantControlCommIEC and CommunicationIEC
• WindPlantControlCommIEC.WindPlantReference,
• WindPlantControlCommIEC.WindPlantMeasurement and
• WindPlantControlCommIEC.PowerDeviceReference
- delete WindPlantControlCommIEC.CommunicationIEC association
- delete CommunicationModuleKind
- delete CommunicationIEC.kind

6458	Normal	302, 457, Issues with different classes modelling the same behaviour WindGridMeasForProtection and WindGridMeasForControl	07/01/2023	CIM18v05	No	

Release Notes

The following changes are applied in 302 and 457
- rename class WindGridMeasForProtection to WindGridMeasurement and adapt the description
- move old associations from class WindGridMeasForControl to WindGridMeasurement and rename association role names
- delete class WindGridMeasForControl

6457	Normal	302, 457 issue WindPlantQControlIEC	07/01/2023	CIM18v05	No	

Release Notes

Changes applied in both 302 and 457
- delete qwpmin and qwpmax for the class WindPlantQControlIEC
- add qwpmin and qwpmax in the enumeration WindLookupTableFunctionKind2

6456	Normal	Typo and old attributes present in 457 and 302	07/01/2023	CIM18v05	No	

Release Notes

- WIndContQIEC2 shall be WindContQIEC2 – the change here is the 2nd letter not capital I but i. This is a typo in both 61970-302 and 61970-457
- In 61970-457 Table 511 (– Attributes of WindDynamicsEd2::WindContPType3IEC2) shall not have the following 2 rows (just delete them). These are leftovers from 2015 version of another IEC standard. The same attributes are present in another model in the standard

tpfiltp3 1..1 Seconds
Filter time constant for power measurement (Tpfiltp3) (>= 0). It is a type-dependent parameter.
tufiltp3 1..1 Seconds
Filter time constant for voltage measurement (Tufiltp3) (>= 0). It is a type-dependent parameter.

- In 61970-302 Table 586 (Attributes of WindDynamicsEd2::WindContPType3IEC2) shall not have the following 2 rows (just delete them). These are leftovers from 2015 version of another IEC standard. The same attributes are present in another model in the standard

tpfiltp3 0..1 Seconds Filter time constant for power measurement (Tpfiltp3) (>= 0). It is a type-dependent parameter.
tufiltp3 0..1 Seconds Filter time constant for voltage measurement (Tufiltp3) (>= 0). It is a type-dependent parameter.

#	Priority	Subject	Completion Date	Solution Version	Breaking Change	Breaking Change Description
6452	Normal	Allow multiple RatioTapChanger on one TransformerEnd	06/04/2024	CIM18v11	Yes	May need product adjustment to handle multiple tap changers on the same winding in simulations like power flow, state estimation...

Release Notes

Applied changes in canonical CIM
- added class StepOperationalLimitTable
- added class StepLimitTablePoint with attributes step and factor
- the association end RatioTapChanger.TransformerEnd is changed from 1 to 0..1
- new association is added between RatioTapChanger and TransformerEnd
- added class ConnectionAngleTapChangerTable with attribute ConnectionAngleTapChangerTable.windingConnectionAngle
- added class ConnectionAngleTapChanger
- added ConnectionAngleTapChanger.minWindingConnectionAngle, maxWindingConnectionAngle, connectionAngleStepSize, windingConnectionAngle, normalWindingConnectionAngle

- added class ImpedanceTapChangerTabular
- added class ImpedanceTapChangerTable
- added class ImpedanceTapChangerTablePoint with the following attributes: xEnd1, xEnd2, xEnd3, rEnd1, rEnd2, rEnd3, step, ratio, angle.
- the text "Note that the upper boundary is not constrained to 100 percent." is added to TapChangerTablePoint.b, .g, .r, .x

Changes are also applied to EQ (452) and SSH profiles (456)

6451	Normal	Cardinality inconsistency for PowerElectronicsConnection<->PowerElectronicsUnit between canonical model and profile	06/04/2024	CIM18v11		

Release Notes

- In the 301 for the UML changed the cardinality from 1..1 to 0..1 on the **PowerElectronicsConnection** role end.
- In the 452 EQ profile changed the direction of the association
- In the 452 EQ profile changed the cardinality on the **PowerElectronicsUnit** role end to 0..*

6359	High	Enumeration PhaseShuntConnectionKind has an "Alias" of "enum" for the enum value "Yn"	10/08/2023	CIM18v07	No	

Release Notes

Removed alias name of "enum" from the enum value "Yn" in the enumeration PhaseShuntConnectionKind.
There is no impact on 452 profiles

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 descroption 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

ExcIEEEAC8B
added the statement "However this model is not supporting this, hence the model AC8C from IEEE 421.5-2016, 7.17 (ExcIEEEAC8C) should be used."

ExcIEEEST6B
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 (ExcIEEEST6C) should be used."

OverexcLimIEEEOEL2C, OverexcLimIEEEOEL3C, OverexcLimIEEEOEL5C
added attribute inputSignalKind and enumeration OverExcitationLimiterInputKind

GovSteamFV4
Update the diagram of GovSteamFV4 to include parameter Sf1
add the foollowing note to the diagram
"The characteristic using Kf1, Sf1 and alpha has the following details:
Ecf = 1 – Omega
If abs(Ecf) < Sf1 :
Cpfc = 0
else:
Cpfc = Kf1 * (abs(Ecf) – Sf1)
If Cpfc > Lps
Cpfc = Lps
If Cpfc < Lpi
Cpfc = 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

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, ACDCConverterDCTerminal
- 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

prefered approach. In order to cover use cases where modelling of open ended branch for pure bus branch models, it is recommended that export at lease 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 is 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 followng 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."

6260	Normal	Associations not conforming to modeling rules	02/11/2023	CIM18v03	No	

Release Notes

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	

Release Notes

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	02/11/2023	CIM18v03	No	

Release Notes

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	

Release Notes

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	

Release Notes

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 UCAIug 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	

Release Notes

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	

Release Notes

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.

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

Release Notes

The top package was renamed to CIM.

6250	Normal	Update of CIM namespace	02/06/2023	CIM18v03	No	

Release Notes

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.

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

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, ACDCConverterDCTerminal, 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 bacause 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.”

5945	High	DCSwitch does not have open flag	02/06/2023	CIM18v03	No	

Release Notes

The class DCSwitch is updated to include 4 attributes: open, normalOpen, locked, retained in order to match the modelling of teh AC Switch.

5870	Normal	BusSegment - Profiles	10/08/2023	CIM18v07	No	

Release Notes

BusSegment class is added to EQ profile. BusSegment.retained is required attribute.

5869	Normal	BusSegment - UML updates	10/08/2023	CIM18v07	No	

Release Notes

BusSegment class that inherits from Conductor is added. The class has attribute BusSegment.retained
The description of the class is: A two terminal and power conducting device of negligible impedance and length represented as zero impedance device that can be used to represent the conductor

between connection points to substation conducting equipment on a substation bus.

The class and the attribute are added to the EQ profile. BusSegment.retained is required attribute in EQ as Switch.retained.

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

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	

Release Notes

The latest Dynamics package that aligns with the newly published **IEC 61970-457 Ed 2.0** and **IEC 61970-302 Ed 2.0** standards has been merged into the IEC61970 package.

5357	Normal	Documentation on ShuntCompensator.grounded and EnergyConsumer.grounded attributes	02/07/2023	CIM18v03	No	

Release Notes

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	

Release Notes

Following the agreement by WG13 on 61970-302. The same statements were applied to 61970-301 template, v02 here:
http://iectc57.ucaiug.org/WG13/Shared%20Documents/61970%20Work%20in%20progress;%20models,%20documents%20and%20issues/CIM18/301%20Ed8/template_iec61970-301-Ed8-v02.docx

5304	Normal	Clarify description on TransformerEnd attributes	02/11/2023	CIM18v03	No	

Release Notes

The following changes are applied

- 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.
- Changed the description of TransformerEnd.rground to: Resistance part of neutral impedance. Zero indicates solidly grounded or grounded through a reactor.
- Changed the description of TransformerEnd.xground to: Reactance part of neutral impedance. Zero indicates solidly grounded or grounded through a reactor.

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.

5299	Normal	ACLineSegment updates for mutual coupling	10/08/2023	CIM18v07	No	but at some point in the future, the MutualCoupling class could be considered for deprecation

Release Notes

Wires package updated with
Add class LineSegmentCoupling, a child of IdentifiedObject

with attributes
.coupledLineNumber
.reverseFlow
.xOffset
Add class CoupledLineSegmentGroup, a child of IdentifiedObject
with no attributes
Add association LineSegmentCoupling.ACLineSegment
Add association LineSegmentCoupling.CoupledLineSegmentGroup

These changes are also applied in 452 SC profile where the following attributes are set to required

.coupledLineNumber
.reverseFlow
.xOffset

MutualCoupling class is set to deprecated in wires package and in 452 SC profile.

5298	Normal	5295:5298 61970 PhaseImpedanceData cleanup for ACLineSegment physical modeling	10/08/2023	CIM18v07	Yes	2 attributes deleted

Release Notes

61970 changes

Deleted attribute PhaseImpedanceData.fromPhase
Deleted attribute PhaseImpedanceData.toPhase

Updated the descriptions of the following classes and attributes:
- ACLineSegment
- ACLineSegment.b0ch
- ACLineSegment.bch
- ACLineSegment.g0ch
- ACLineSegment.gch
- ACLineSegment.r
- ACLineSegment.r0
- ACLineSegment.x
- ACLineSegment.x0
- ACLineSegmentPhase
- ACLineSegmentPhase.phase
- ACLineSegmentPhase.sequenceNumber
- Conductor.length
- PerLengthImpedance
- PerLengthLineParameter
- PerLengthPhaseImpedance
- PerLengthPhaseImpedance.conductorCount
- PerLengthSequenceImpedance
- PhaseImpedanceData
- PhaseImpedanceData.b
- PhaseImpedanceData.column

- PhaseImpedanceData.g
- PhaseImpedanceData.r
- PhaseImpedanceData.row
- PhaseImpedanceData.x

5285	Normal	Addition of value3 attributes in BasicIntervalSchedule and RegularTimePoint (possibly IrregularTimePoint as well to be consistent?)	06/21/2022	CIM18v02	No	

Release Notes

A third set of value related attributes have been added to the **BasicIntervalSchedule** , **RegularTimePoint** , and **IrregularTimePoint** classes where applicable. The specific changes included:

BasicIntervalSchedule.value3Multiplier (UnitMultiplier)
BasicIntervalSchedule.value3Unit (UnitSymbol)
BasicIntervalSchedule.value3Description (String)
RegularTimePoint.value3 (Float)
IrregularTimePoint.value3 (Float)

5151	Normal	Addition of value description attributes to BasicIntervalSchedule class.	06/21/2022	CIM18v02	No	

Release Notes

The following two attributes have been added to the **BasicIntervalSchedule** class:

BasicIntervalSchedule.value1Description (String) "Description for value1."
BasicIntervalSchedule.value2Description (String) "Description for value2."

5113	Normal	NonlinearShuntCompensator has ambiguity in definition of per section or total	02/11/2023	CIM18v03	Yes	Some attributes were renamed.

Release Notes

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	

Release Notes

Two tag values were added to the UML
uri which has the URI of the package, e.g. http://ucaiug.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	

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.

5107	Normal	New Names proposal - inverted associations	10/19/2021	CIM18v01	No	

Release Notes

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.

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

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.

5098	High	CsConverter targtAlpha and targetGamma	02/04/2024	CIM18v10	Yes	Change of cardinality in SV profile 61970-456

Release Notes

The description of CsConverter.targetAlpha is modified to "Target firing angle. It is converter’s control variable used in power flow. It is only applicable for rectifier control. Allowed values are within the range minAlpha<=targetAlpha<=maxAlpha. The attribute shall be a positive value.
"
The description of CsConverter.targetGamma is modified to "Target extinction angle. It is converter’s control variable used in power flow. It is only applicable for inverter control. Allowed values are within the range minGamma<=targetGamma<=maxGamma. The attribute shall be a positive value.
"
- added the following text to CsConverter: "Attributes targetAlpha and targetGamma are mutually exclusive therefore only one of them can be defined to describe an operating target."

In 61970-456
- SV profile: changed CsConverter.alpha to optional
- SV Profile: changed CsConverter.gamma to optional
- The following constraints are added in SV profile
• C:456:SV:CsConverter.alpha:cardinality
The CsConverter.alpha is required if CsConverter.operatingMode equals CsOperatingModeKind.rectifier. CsConverter.gamma is not exchanged in this case.

• C:456:SV:CsConverter.gamma:cardinality
The CsConverter.gamma is required if CsConverter.operatingMode equals CsOperatingModeKind.inverter. CsConverter.alpha is not exchanged in this case.

5067	High	Remove out of date Dataset and Profile UML	09/28/2021	CIM18v01	No	

Release Notes

The following association and attribute updates were applied to the **Dataset** related classes within the **GenericDataSet** package:

- Removed the **Dataset-Profile** role
- Removed the **Profile** class from the diagram.
- Removed the **Dataset.name** and **Dataset.description** attributes.
- A new **Part303** package was introduced under the top level **IEC61970** package and is a peer package to **Base**. Subsequently the **GenericDataSet** 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)

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.

Release Notes

The following changes were applied to CIM18 to address insufficiency in the existing Names construct in the 61970 package:

- Add a new association i.e. **Name (0..n) --> IdentifiedObject (0..1)** to handle alternative identifiers distinct and different from alternate names (i.e using the existing associatoin).

- Added a new class **ObjectType** to the Core package
  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	

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	

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.

#	Priority	Subject	Completion Date	Solution Version	Breaking Change	Breaking Change Description
5061	Normal	Address issues and clarity around the Control.controlType description	08/24/2020	CIM18v00	No	

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	

Release Notes

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

5057	Normal	The description for ShuntCompensator has an error that must be corrected.	07/01/2020	CIM18v00	No	

Release Notes

Addressed an error in the description of **ShuntCompensator** . 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	

Release Notes

It was discovered in the published release of IEC 61970-301 Ed. 7.0 that the **TapChangerControl** class had an issue in the cardinality of the **RegulatingControl.RegulatingCondEq** association inherited from **RegulatingControl** . 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 **TapChangerControl** must reference at least one instance of a **RegulatingCondEq** class type via the **RegulatingCondEq.RegulatingControl** association. This requirement could not be fulfilled for **TapChangerControls** 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	

Release Notes

Per an IEC 61850 harmonization recommendation (Recommendation R4) the CIM classes **BusbarSection** and **Junction** descriptions were updated. From a topology processing point of view the two classes are equivalent. In addition, **ConnectivityNodes** 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 **ConnectivityNodes** to be associated with **BusbarSections** , **Junctions** 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.

#	Priority	Subject	Completion Date	Solution Version	Breaking Change	Breaking Change Description
5052	Normal	Typographical errors needing correction in CIM18	06/16/2020	CIM18v00	No	

Release Notes

Minor typographical updates to descriptions of **OperatingParticipant** , **IdentifiedObject.aliasName** , **CurveData.xvalue** , **BaseVoltage** , and **BasicIntervalSchedule** .

5051	Normal	The description on the WaveTrap class is incorrect.	06/15/2020	CIM18v00	No	

Release Notes

The description on the **WaveTrap** 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	

Release Notes

Corrected minor typos and wording issues discovered in the **BusNameMarker** role end description for the association between **TopologicalNode** and **BusNameMarker** . 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.”

5049	Normal	Inconsistent naming for p,q,r,x and others	02/04/2024	CIM18v10	No	

Release Notes

This issue is closed and no changes were applied following the final decision in ticket 6202.

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

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.

- Modeified 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:EquivalenInjection:instance

Using EquivalentInjection to model a distribution network equivalent is recommended practice instead of using ExternalNetworkInjection-s.

#	Priority	Subject	Completion Date	Solution Version	Breaking Change	Breaking Change Description
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

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.

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.

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.y1value-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.

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

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.

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

Release Notes

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

PhaseTapChangerLinear.xMin
PhaseTapChangerNonLinear.xMin

5005	High	GroundDisconnector examples. The intended use of GroundDisconnector	09/19/2024	CIM18v13	Yes	Modelling of Ground, GroundDisconnector is changed

Release Notes

The following changes are applied in 301/UML
- added stereotype deprecated to GroundDisconnector
- modified description of Disconnector
- added EarthingSwitch
- 301 document template is updated

The following changes are applied in 452 - EQ
- added stereotype deprecated to GroundDisconnector
- added EarthingSwitch

The following changes are applied in 456 - SSH
- added stereotype deprecated to GroundDisconnector
- added EarthingSwitch

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

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.

4986	Normal	Need model of two terminal FACTS deviceThe CIM UML model c	06/19/2024	CIM18v12	No	
4943	High	ControlAreaGenratingUnit2: IOP suggest to clarify the usage	10/08/2023	CIM18v07	No	

Release Notes

ControlAreaPowerElectronicsUnit class with association with PowerElectronicsUnit and ControlArea were added. The same pattern is followed as between ControlArea and GeneratingUnit. Class and property descriptions are the same except for the classes.

61970-452 is updated to include the class and the 2 associations

4934	Low	Modelling of PotentialTransformer and CurentTransformer	10/08/2023	CIM18v07	Yes	Some attributes are deleted, but these are not used in WG13 profiles

Release Notes

The following attributes were removed as they are Asset related, they are not necessary for wires-based application and should not be in the Grid package.
- PotentialTransformer.accuracyClass
- PotentialTransformer.ptClass
- CurrentTransformer.accuracyClass
- CurrentTransformer.ctClass

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

Release Notes

Both the RatioTapChanger.tculControlMode 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.

4918	High	EnergySource attributes rn and xn should be named r2 and x2	10/08/2023	CIM18v07	No	

Release Notes

EnergySource attributes rn and xn were changed to r2 and x2. The changes are also applied in 452 SC profile

4917	High	Documenation of LoadResponseCharacteristic exponents Sugg	02/19/2023	CIM18v04	No	

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.

4916	Normal	documenation on VoltagteControlZone is wrong. This may hav	02/04/2024	CIM18v10	No	

Release Notes

Deprecated class VoltageControlZone

4806	Normal	ERCOT angle difference limit setAngleDifferenceLimitSet -	10/08/2023	CIM18v07	No	

Release Notes

VoltageAngleLimit class added to the OperationalLimits package.

VoltageAngleLimit - Voltage angle limit between two terminals. The association end OperationalLimitSet.Terminal defines one end and the host of the limit. The association end VoltageAngleLimit.AngleReferenceTerminal defines the reference terminal.

It has association with Terminal. It has attribute isFlowToRefTerminal.

It has attribute value and normalValue - The difference in angle degrees between referenced by the association end OperationalLimitSet.Terminal and the Terminal referenced by the association end VoltageAngleLimit.AngleReferenceTerminal. The value can be positive, negative or zero depending on the angle difference between the two terminals.

Attributes normalValue and isFlowToRefTerminal are added to EQ profile in 452. Attribute value is added to SSH in 456.