

WG13 Issues - CIM Issues #5045

Voltage-dependent reactive capability curve support

09/14/2021 03:48 PM - Herbert Falk

Status:	Closed	
Priority:	High	
Target version:		
Author/Contact Info:	Todd Viegut	Standard(s):
Base Release:	CIM17	Version:
Solution to be Applied To:	CIM18v03	Clause:
Solution Version:	CIM18v03	Sub-Clause:
Solution Applied By:	Chavdar Ivanov	Paragraph:
Completion Date:	02/07/2023	Table:
CIM Keywords:	61970-Wires	Originally Closed in Version:
Breaking Change:	Yes	Origination Date: 01/14/2020
Breaking Change Description:	There are changes to association end names and cardinalities. Due to association directions changes might also be seen as not breaking.	Origination ID: 13_299
CIM Impacted Groups:	WG13	Originally Assigned To:
Requestor:		

Description

Per CDV country comments CH_61, NO54 & SE59 for 301 Ed7:

Voltage dependent capability curves are currently not supported by CIM.

Proposed Solution

Voltage dependent capability curves deferred to CIM18.

Assign to Physical Devices Subgroup

Decision

[PDG]

1. To propose a new terminalVoltage attribute to the ReactiveCapabilityCurve
2. Add the coolantTemperature/hydrogenPressure & the proposed terminalVoltage attributes to the 452 EQ profile
3. Add multiple ReactiveCapabilityCurve to one SynchronousMachine to 452

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.

History

#1 - 09/14/2021 06:29 PM - Eric Stephan

- Subject changed from Per CDV country comments CH_61, NO54 & SE59 for 301 Ed7:

V to Per CDV country comments CH_61, NO54 & SE59 for 301 Ed7:V

- Proposed Solution updated

- Decision updated

#2 - 12/01/2021 11:46 AM - Eric Stephan

- Proposed Solution updated

- Decision updated

#3 - 04/08/2022 09:57 AM - Yang Feng

- Solution to be Applied To changed from 61970cim18 to 61970cim18v2

- Decision updated

- CIM Keywords 61970-Wires added

n..n association of ReactiveCapabilityCurve <-> SynchronousMachine is dropped from 452 (by purpose, due to the unsupported nature of model instance difference when it comes to associations).

coolantTemperature/hydrogenPressure is also not available in 452 EQ profile

#4 - 05/08/2022 09:52 PM - Yang Feng

- Subject changed from Per CDV country comments CH_61, NO54 & SE59 for 301 Ed7:V to Voltage dependent capability in CIM

#5 - 05/09/2022 10:50 AM - Yang Feng

- Subject changed from Voltage dependent capability in CIM to Voltage dependent capability

#6 - 05/09/2022 10:51 AM - Yang Feng

- Subject changed from Voltage dependent capability to Voltage-dependent reactive capability curve support

#7 - 09/19/2022 04:11 PM - Eric Stephan

- Priority changed from Normal to High

#8 - 09/19/2022 04:12 PM - Eric Stephan

- Status changed from Open to Review

#9 - 09/22/2022 02:24 PM - Eric Stephan

- Status changed from Review to In Progress

#10 - 02/06/2023 04:31 PM - Chavdar Ivanov

- Solution to be Applied To changed from 61970cim18v2 to CIM18v03

- Solution Version set to CIM18v03

- Solution Applied By set to Chavdar Ivanov

- Completion Date set to 02/06/2023

- Breaking Change changed from No to Yes

- Breaking Change Description set to There are changes to association end names and cardinalities. Due to association directions changes might also be seen as not breaking.

- Release Notes updated

#11 - 02/06/2023 05:46 PM - Chavdar Ivanov

452 UML changes need to be updated before closing the issue. 301 is done and 452 template too

#12 - 02/07/2023 01:24 AM - Chavdar Ivanov

- Status changed from In Progress to Closed

- Completion Date changed from 02/06/2023 to 02/07/2023

- Release Notes updated

UML, UMP profiles and 452 template was updated. The issue is closed.