

## WG13 Issues - CIM Issues #6599

### Exchange of solution for DC and modifications to DCTerminal

11/15/2023 07:30 AM - Chavdar Ivanov

<b>Status:</b>	Closed	
<b>Priority:</b>	High	
<b>Target version:</b>		
<b>Author/Contact Info:</b>	Chavdar Ivanov	<b>Standard(s):</b>
<b>Base Release:</b>	CIM18	<b>Version:</b>
<b>Solution to be Applied To:</b>	CIM18v10	<b>Clause:</b>
<b>Solution Version:</b>	CIM18v10	<b>Sub-Clause:</b>
<b>Solution Applied By:</b>	Chavdar Ivanov	<b>Paragraph:</b>
<b>Completion Date:</b>	02/04/2024	<b>Table:</b>
<b>CIM Keywords:</b>	61970-DC	<b>Originally Closed in Version:</b>
<b>Breaking Change:</b>	No	<b>Origination Date:</b>
<b>Breaking Change Description:</b>		<b>Origination ID:</b>
<b>CIM Impacted Groups:</b>	WG13	<b>Originally Assigned To:</b>
<b>Requestor:</b>		

#### Description

There is a need to exchange information on voltage (dc voltage) and power to DC part of the grid in the same way like for the AC part of the model. In addition the DC terminal is missing polarity

#### Proposed Solution

- Add class SvPowerFlowDc 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.

- add association between DCTerminal and SvPowerFlowDC

- Add class SvVoltageDC that inherits from StateVariable and has association with DCTopologicalNode. The description is: State variable for direct current voltage.

- Add SvVoltageDC.v with description State variable for direct current voltage.

- Add DCTerminal.polarity with datatype enumeration DCTerminalPolarityKind (positive and negative)

Description: Represents the normal network polarity condition.

Discuss possible alignment with ACDCConverterDCTerminal

15 Nov 2023

On the polarity:

- we need some information from Measurement

- there is thinking that + and - might change. This needs to be double checked and based on this we can see what is in the EQ and what can be in result and if it should be exchanged.

On the Sv classes

we agree to add the classes, but call them SvDCPowerFlow and SvDCVoltage

13 Dec 2023:

Chavdar checked that we have two situations depending on the HVDC type/configuration. In case we have HVDC that uses VSC technology, we need explicit polarity of the terminals in the DC part of the grid. However, for LCC technology the polarity of the terminals at the DC side is changing depending on the direction of the power flow. Therefore in the profile we have to keep the polarity optional and have constraints to require or not depending on the technology.

#### Decision

Reviewed on 20-Dec-2023 in weekly WG13 modeling call:

#### DECISIONS:

Agreed to apply the outcomes of Chavdar's investigation (see notes for 13-Dec-2023 in the proposed solutions).

#### 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.

#### History

##### #1 - 11/15/2023 10:33 AM - Chavdar Ivanov

- Proposed Solution updated

##### #2 - 12/13/2023 10:11 AM - Chavdar Ivanov

- Status changed from New to Open

- Proposed Solution updated

##### #3 - 12/13/2023 10:12 AM - Chavdar Ivanov

- Proposed Solution updated

##### #4 - 12/20/2023 11:03 AM - Todd Viegut

- Proposed Solution updated

- Decision updated

##### #5 - 01/17/2024 09:44 AM - Chavdar Ivanov

- Status changed from Open to Review

##### #6 - 02/04/2024 12:53 AM - Chavdar Ivanov

- Status changed from Review to In Progress

- Author/Contact Info set to Chavdar Ivanov

- Base Release set to CIM18

- Solution to be Applied To set to CIM18v10

- Solution Version set to CIM18v10

- Solution Applied By set to Chavdar Ivanov

- Completion Date set to 02/04/2024

- Breaking Change set to No

- Release Notes updated

##### #7 - 02/04/2024 12:53 AM - Chavdar Ivanov

- Status changed from In Progress to Closed

#### Files

DCSolution.docx

84 KB

11/15/2023

Chavdar Ivanov