IEC TC57 WG10 Future Work - WG10 Future Work #6700

Investigate to align to the new CIM model of transformers

02/08/2024 02:43 AM - Aurelie Dehouck

Status:	New	**Start date:**	02/08/2024
Priority:	Normal	**Due date:**	
Assignee:		**% Done:**	0%
Category:		**Estimated time:**	0.00 hour
Target version:			
Source:		**Standard(s):**	IEC 61850-6
TF Unique ID:		**Needs More Information:**	No
WG10 Proposal:		**Assigned TF:**	61850-6
Discuss in Upcoming Meeting:	No	**Target edition:**	Next
Short Proposal:			

Description

The Model of PowerTransformers changed after CIM v15 (for the reasons explained bellow).

SCL model of CIM PowerTransformer is aligned to older model.

Investigate to align with this new model for harmonization.

Copied from "Common Information Model (CIM) Primer: Eighth Edition" - EPRI (https://www.epri.com/research/products/000000003002006001)

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Transformers After CIM v15
As the CIM has moved beyond its original roots in modeling balanced transmission networks into the distribution world there was a desire to create a single, harmonized transformer model that is:

- Suitable for phase balanced or unbalanced networks
- Suitable for representing unbalanced construction commonly used for low voltage distribution networks
- Allows for simultaneous representation of network components as both balanced and unbalanced depending upon the level of detail desired (that is, when performing detailed phase unbalance studies on nominally balanced high voltage networks, or for modeling the transition between balanced and unbalanced representations)

A group of experts worked on an update to the CIM transformer model to reflect these requirements, which was then integrated into the draft of CIM v15.

Changes to Transformer Model
There are a number of significant changes compared with the previous model that was described in the previous section:

- **PowerTransformer** now inherits from **ConductingEquipment** rather than Equipment so the **Terminals are now associated with the PowerTransformer rather than the windings** as with the previous representation.
- **TransformerWinding** now **renamed to TransformerEnd** . This is because the term winding was felt to imply that the model represented the internal configuration of the transformer, but in reality the TransformerWinding was really describing the transformer's terminals. Since the term Terminal is already used in the CIM TransformerTerminal would have been confusing and ambiguous so the term TransformerEnd was used instead.
- Additional classes were added to model transformer tanks, typically used in distribution systems where a single transformer contains multiples tanks each with its own TransformerTankEnds.
- The transformer impedance and admittance attributes as star or mesh explicitly. Previously these attributes appeared on the TransformerWinding
  class which meant that on a two-winding transformer the impedance between the primary and secondary windings would be put on the primary
  winding with zero values on the secondary winding.
- Impedances and admittances can be defined once and re-used across multiple instances, reflecting the concept of catalogues of common values that are used across multiple instances in distribution networks. The ability to explicitly define impedance and

admittance values on the TransformerEnd is still maintained.
- The TapChanger model is expanded to explicitly model not only ratio and phase tap changers explicitly but also specializations of PhaseTapChanger for symmetrical and asymmetrical models.

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History

#1 - 02/08/2024 05:26 AM - Vladan Cvejic

- Standard(s) set to IEC 61850-6

- Target edition changed from Not assigned to Next

- Assigned TF 61850-6 added

- Assigned TF deleted (None)