

Task Force

Distributed Photo Voltaic (DPV) Grid Transformers

Lombard IN

Monday, October 26, 2009

IEEE TC Meeting

8:0 am, Lilac B/D

Westin Hotel

Draft Minutes of TF meeting

The meeting started at 8 am in Lilac B/D with a total of 21 attendees: members (6) and guests (15) in attendance. The Chair introduced Mr. Mathieu Sauzay as the new Vice Chair for the TF as Mr. Amitav Mukerji from ABB has indicated that he may not be able to attend consistently the IEEE IC meetings. Per the IEEE guidelines any disclosures related to existing patents associated with the TF work were enquired from the audience. Barring none Mr. M Sauzay then introduced two documents

These two documents were:

- 1) IEEE 1277 – requirement for Dry Type and DC reactors
- 2) C-57 129 General requirements of test for high voltage transformers

Interesting information on a revision of a document related to HV DC transformers and smoothing reactors was also presented. This relates to DPV transformers, as those are continuous sources of power–

Conclusion -We have to study Standards available that may have related topics and concerns.

Several Questions were posed to the TF membership in general:
i.e.

- 1) All Stds that address problems related to DC loads or DC networks?
- 2) Anything that is associated with DPV Transformers should be addressed by the TF moving forward.

It was suggested that SC on HVDC Transformers - with Mr. Richard Dudley, Chair could answer these questions – as suggested by Mr. Tom Prevost. The Chair attended Mr. Dudley's session later that day and presented the help our TF needs.

Ms. Jane Verner – indicated that at the moment they deal with 5 or 6 MW load on some PV transformers. There is voltage variation related to varying load conditions resulting in AC variation.

Mr. Bill Chu indicated that SCE on the West Coast has experienced similar conditions; in its entirety it is addressed as a System interaction issue.

Mr. Tom Prevost inquired what the charge of the TF was? – How does the TF position itself as related to a

Position paper

User Guide

Or

A

Standard

Per Mr. Tom Prevost 's request specific charge was read out

- What perceived problems may exist that are not addressed by existing papers, literature etc. – list of perceived problems should be created

Mr. T Lundquist elaborated that:

Are the questions in the charge to the TF answerable?

Ms. J Verner indicated that

Voltage Regulation? – as experienced at a 2 MW plant in NJ

Another example cited was in Washington, DC – 20 houses on the mall – competing on efficiency criterion!

There was a comment that DOE has a lot of stds related to smart grid – take a look at it.

Dr. H M Shertukde indicated that at the last Admin – Committee deliberations

- Smart Grid implications were discussed as indicated by Mr. Tom Lundquist. What Impact will this TF activity have on Smart Grid Business? Any other related activity of the OLTC group that may affect the activity and proceedings of this DPV TF.

TF on DPV Grid Transformers was also asked to take input from Paralleling of transformers WG— especially related to distribution automation, automatic segmentation of power lines and redirection of power flow.

TF was advised to take a look at projects that can have similar activities related to two directional power flow and associated with the smart grid activity.

Additionally, solar power and windmill on a house creating a bi-directional power flow will have an effect on the transformer that provides the power tie resulting into a possible:

dc bias on the transformer!

Mr. Tom Lundquist also indicated creation of Harmonic and the related limitations!

It was reported that Distribution transformers often experience this variation.

Other perceived IEEE Stds on interfacing of transformers with harmonic variations were to be looked at!

Metering problems for homes – Watts, amps etc? – Related to distribution transformers need to be evaluated

Significant increase in loads!

Core saturation! Combined wind power generators and PV – loads vary – related to prospective car batteries in the near future!

Storage was also perceived as a potential problem/opportunity!

Thirteen major issues were addressed and a matrix of problems perceived was formulated.

Additional Thermal Cycling of such transformers was an important issue to be considered for evaluation.

It was reported by Jerry Murphy that beyond Medium power range— no inverter packs yet available.

In summary, a matrix of perceived problems thirteen (13) and related standards seventeen (17) was created as follows:

	C57.18.10	C57.110	C57.129	C57.91	C57.19.03	IEC	Std 929	C57.116	Std 1547.1 -3	C84.1 1995	Std 519	UL 1741	C57.12.40	C57.12.34	1013	1145	937
Voltage flicker / Variation																	
Harmonics / wave form distortion																	
Freq Variation																	
Pf variation																	
Safety/protection Related to public																	
Islanding																	
Relay Protection																	
DC Bias																	
Thermo cycling																	
Power quality																	
Power Storage																	
Transients																	
Magnetic Inrush current																	
Assigned individual	MS	HMS		CJK		KV	JV	SKS	JRM	BC	EBR	JV		SDS			

After the deliberations of the TF it was decided that at the next meeting of the TF at the IEEE TC meeting in Houston in Spring 2010, the results of the above evaluation of all the perceived problems related to the DPV Grid Transformers already covered or not adequately addressed in the specific standards will be presented. The aggregate coverage will be reported and cumulated to create a comprehensive document as a first part of satisfying the charge of the TF as laid down in its Porto, Portugal meeting in October of 2008.

Later this report will be submitted to the Admin committee of the IEEE IC, to pave the future course of action and further activity of the TF.

Respectfully submitted
Hemchandra Shertukde, Ph.D., P.E.
TF Activity Chair