MINUTES OF THE MEETING OF THE HVDC CONVERTER TRANSFORMERS & SMOOTHING REACTORS S.C. IN RALEIGH, NORTH CAROLINA, MAR. 17, 2003

The S.C. met in the Governors II Room of the Sheraton Capital Center Hotel in Raleigh, North Carolina on March 17, 2003 from 1:45 – 3:00 p.m. There were 7 members and 6 guests present. The following are the highlights.

1. The issue of how to handle transformers utilized in conjunction with HVDC schemes based on voltage source converter technology was discussed. This technology is relatively new and is continuing to evolve. There are different schemes and the operating stresses seen by the transformers may vary. With voltage source converter technology the harmonic currents typically seen by the transformer are low but the harmonic voltages are a function of the filtering. Another important aspect of voltage source converter technology is that there is no DC on the valve winding and therefore the DC tests required for converter transformers used with current commutated converters do not apply. No load losses are also an important aspect of transformers used with voltage source converters.

   The final conclusion was that the technology for voltage source converter based HVDC schemes is continuing to develop and thus it is premature to have a separate standard. It is perhaps best to include an informative annex in the next revision of IEEE C57.129. Peter Heinzig and Pierre Riffon agreed to produce a first draft. Peter Heinzig stated that he had a paper that contained useful information. It could be listed in the Bibliography of the annex. Members of the S.C. are requested to identify other useful papers.

   The scope of IEEE C57.129 should be reworked. The main body of the standard covers converter transformers utilized in conjunction with current commutated converters. Transformers utilized in conjunction with voltage source converters will be covered in an annex.

2. Annex A will be expanded to include various loss measurement methodologies. Peter Heinzig's draft write-up on the use of impedance analyzers to determine the Harmonic Loss Factor and a description re the use of electronic wattmeters will be integrated into Annex A. Robin Taylor and Alan Forest will draft the portion on the use of wattmeters.

3. Waldemar Ziomek's draft annex on overloading of converter transformers will form the basis for an annex of broader scope. There should be more emphasis on test code. What is the appropriate test methodology especially if there is a low ambient overload? Guidelines are required especially if testing is carried out under a normal ambient. Pierre Riffon will draft a section on testing and limits. The main concerns under overload are losses in core, clamping structures, tank etc.

Peter Heinzig will redraft Clause 5.2 to include details on how to specify overloads for converter transformers. The real issue is how to specify replacement converter transformers. New converter transformers are part of a "turn key" system supply. Input will be sought from Les Rickseidler of Manitoba Hydro re the specification of replacement converter transformers as he has just gone through a large replacement program. Pierre Riffon will contact Les re input.

4. At the upcoming PES meeting in Toronto in July 2003, RFD will attend appropriate meetings in the HVDC technology area to ascertain if proper coordination is being maintained; equipment standards (IEEE C57.129, IEEE 1277) vs systems orientated documents.

The meeting adjourned at 3:00 p.m.

Richard F. Dudley

RFD:jl
(99738)