MINUTES OF THE MEETING OF THE HVDC CONVERTER TRANSFORMERS & SMOOTHING REACTORS S.C. IN MINNEAPOLIS, MINNESOTA, OCT. 15, 2007

The HVDC Converter Transformers and Smoothing Reactors S.C. met on Oct. 15, 2007 at 1:45 p.m. in the Duluth Meeting Room of the Minneapolis Hilton Hotel with 9 members and 12 guests present. The following are the highlights.

1. Introductions were made.

2. IEEE patent policy was reviewed and no issues were raised.

3. The minutes of the Dallas meeting were approved.

   Note: The minutes of the Minneapolis meeting won't be approved until the meeting of the S.C. in Charlotte, NC.

4. The Chairman briefed S.C. members on the meeting of the Administrative S.C.

5. The Chairman notified members and guests that PC 57.129 had been approved by the IEEE Standards Board. There was an issue related to "references" but the proposal to move "non cited" documents to the "Bibliography" was accepted by S.C. members. PC 57.129 will now proceed to publication.

6. The remainder of the meeting focused on the revision of IEEE 1277. The following are the highlights.

   (i) 800 kV HVDC technology is being developed. Should it be covered in the revision of IEEE 1277 and, if so, how? Should an informative annex be written and when since 800 kV HVDC is a "work-in-process"? Test values for converter transformers and smoothing reactors are an issue; test levels for switching impulse etc.

   A presentation was made by Ulf Radbrandt on tests carried out on various pieces of equipment for 800 kV HVDC application; converter transformers etc.

   Christoph Ploetner made a presentation on tests carried out on converter transformers and 800 kV bushings.

   Richard Dudley, the Chairman described the successful testing of a prototype dry-type air core smoothing reactor for 800 kV HVDC application.

   Pierre Riffon pointed out a number of observations. For 800 kV DC the lightning impulse test level may be lower then the switching impulse test level. Achieving a full tail for the switching impulse may be an issue in most test labs.

The consensus of the S.C. is that no action should be taken re 800 kV HVDC in the revision of IEEE 1277 until more information is available; monitoring will continue.

(ii) Pierre Riffon agreed to draft more material on overloads and overload testing. In the case of oil-immersed SMRs the information in the converter transformer standard will be useful; including gas analysis. In the case of dry-type SMRs overload testing can be part of the temperature rise type test. Allowable temperature rise limits during overload should be addressed.

(iii) Sequence of tests is important for oil-immersed SMRs. A sequence should be recommended. What is the appropriate sequence of tests for dry-type SMRs? The a.c. power test should be the final test for dry-type SMRs. Should the temperature rise design test be performed before dielectric tests?

(iv) Ventilation clearance requirements should be recommended for dry-type SMRs re the temperature rise design test. RFD will make a recommendation.

(v) Klaus Papp and Christoph Ploetner will upgrade/update the audible sound test section.

(vi) Ulf Radbrandt, Lars-Erik Juhlin and Christoph Ploetner will provide additional material for Annex E re SMRs for VSC HVDC schemes.

(vii) A rule needs to be developed for the “a.c. power test” if the required test voltage cannot be met; lower voltage but longer duration.

(viii) There are concerns that since a full tail cannot be achieved in most cases for the switching impulse test that the insulation system of a SMR will not be as fully stressed as it will be in-service. How can factory dielectric testing properly simulate converter malfunction, converter failure, switching etc.? Should the capacitor discharge test be a type or design test vs. OTHER? This test can be performed at most test labs that have a CB synthetic test facility.

Once the Chairman receives input from S.C./W.G. members on the various issues he will produce Draft #2 well before the next S.C. meeting in Charlotte. The meeting adjourned at 3:00 p.m.

R. Dudley

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