MINUTES OF THE MEETING OF THE HVDC CONVERTER TRANSFORMERS & SMOOTHING REACTORS S.C. IN PORTO, PORTUGAL, OCTOBER 4, 2008

The HVDC Converter Transformers and Smoothing Reactors S.C. met on October 4, 2008 at 12:00 p.m. in the Tamega Meeting Room of the Porto Palacio Congress Hotel, in Porto, Portugal. There were 14 members and 13 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 Charlotte meeting were approved.

   Note: The minutes of the Porto meeting will not be approved until the meeting of the S.C. in Miami, Florida.

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

5. The remainder of the meeting focused on discussion of Draft #2 of the revision of IEEE 1277; including input received and distributed by SC/WG members prior to the meeting. The following are the highlights:

   (i) Ugo Piovan made a short presentation on the work of CIGRE JWG A2/B4-28; design review, oil conductivity (It was noted that IEC recommends that oil conductivity testing be carried out at a stress of .5kV/mm whereas the WG felt that it should be carried out at levels representative of the in-service stress of 10 kV/mm. What are the stress levels used in the ASTM test?). The documents/papers produced by CIGRE JWG A2/B4-28 will be referenced appropriately in the revision of IEEE 1277. Ugo Piovan will provide details, as they are available, to the Chairman.

   Per Pierre Riffon, records are not usually kept regarding test stress level and time for oil conductivity.

   In many cases, the oil used to fill the converter transformer or oil-immersed SMR (including its conductivity) for testing is different from the oil (including its conductivity) used in service.

   CIGRE JWG A2/D1 is specifically looking at testing of oil conductivity.

   A copy of Ugo Piovan's presentation is attached to the minutes.

(ii) The additional material for the annex on VSC based HVDC schemes drafted by Lars-Erik Juhlin and Ulf Radbrandt will be further expanded upon by Lars-Erik Juhlin and Christoph Ploetner.

(iii) A brief informative annex on 800kV HVDC and the applicability of the standard to smoothing reactors for such schemes will be drafted by Lars-Erik Juhlin and Christoph Ploetner. Basically the test methodology is applicable but test levels are in evolution and are specific project based.

(iv) The gassing limits under overload in Annex D will be reviewed by Lars-Erik Juhlin and Christoph Ploetner re applicability to oil immersed HVDC SMRs as they were taken from IEEE C57.129 (converter transformers). It was noted that gas evolution can be from metallic structural elements as well as the insulation system. Clause D.2 "Overloading In Service" will be revised; including appropriate references to the IEC transformer loading guide.

(v) The switching impulse wave shape was discussed. Pierre Riffon proposed that if the switching impulse wave shape could not be met then consideration should be given to performing a capacitor discharge test which is listed as OTHER. The crest voltage should be equal to the switching impulse crest voltage level. Performing a capacitor discharge test as a design test is preferable to increasing the crest voltage of the standard lightning impulse test which could over stress the insulation system etc. The capacitor discharge test can be performed using the capacitor bank for a synthetic test circuit or an impulse generator with the resistance removed. More information is required to be included in the revision of IEEE 1277 on how to perform the test; including dealing with the possible voltage overshoot.

Input is requested from SC/WG members.

(vi) In Table 2 "short circuit verification" will be more appropriately called "short circuit withstand capability verification". Note 3 is OK.

(vii) The Chairman requested that SG/WG members use Pierre Riffon's editorialized version of Draft #2 as the basis for any input.

(viii) The Chairman stated that his objective was to produce Draft #3 in early 2009; allowing plenty of time for the SC/WG to review before the Miami Meeting and then he would like to start the ballot process after the Miami Meeting of the SC.

The Chairman thanked SC/WG members for their contributions to date, and the meeting adjourned at 1:15 p.m.

R. Dudley
(08132)