MINUTES OF THE MEETING OF THE HVDC CONVERTER TRANSFORMERS & SMOOTHING REACTORS S.C. IN MEMPHIS, TENNESSEE, OCT. 24, 2005

The S.C. met in the Venetian Room of the Peabody Hotel in Memphis, Tennessee on Oct. 24, 2005 from 1:45 p.m. to 3:00 p.m. There were 10 members and 7 guests present. The following are the highlights of the meeting.

1. The minutes of the S.C. meeting in Jackson were approved. The minutes of the Memphis meeting will not be approved until the S.C. meets in Costa Mesa, California.

2. IEEE patent policy was reviewed; details are available on the Transformers Committee website. No patents affecting the revision process of IEEE C57.129 were noted.

3. The Chairman reported on the meeting of the Administrative S.C.

4. The Chairman informed the S.C. that an application for a PAR to revise IEEE 1277 (smoothing reactors for HVDC application) had been submitted. Questions were raised by 2 members of NesCom re the "scope" and "purpose". The Chairman modified the "scope" and "purpose" to attempt to satisfy the comments from the NesCom members but had reservations; existing "scope" and "purpose" (declared in abstract) was approved in 2001 by NesCom and seemed adequate. What will be the potential impact of NesCom's current position on other Transformers Committee documents when a PAR is submitted for revision? The issue was discussed at the Administrative S.C. meeting.

5. Plans are in process for the S.C., in co-ordination with the Audible Sound S.C. and the Performance Characteristics S.C., to sponsor or co-sponsor a tutorial on sound at the Costa Mesa meeting. Reactors and transformers utilized in HVDC will be included; converter transformers, smoothing reactors (oil-immersed and dry type) and filter reactors (dry-type).

6. Draft #4 of the revision of IEEE C57.129, prepared by RFD based on inputs from various S.C. members was discussed. The highlights are as follows.

   (i) Some members did not receive D#4; attachment to an e-mail. The Chairman will resend the e-mail.

   (ii) Comments submitted by Lars-Erik Juhlin were discussed and accepted. In most HVDC projects the converter transformer valve side d.c. bushings extend into the valve hall with resultant considerations. The Chairman will incorporate LEJ's comments into D#5.

   (iii) The issue of measurement of commutation reactance was raised by a number of S.C. members. Although the measurement/determination of commutation reactance is important from an HVDC system point of view the S.C. felt that it

was not appropriate to include such methodology in IEEE C57.129. Converter transformer leakage reactance is one component of commutation reactance. It was proposed to add the following note, "Commutation reactance is important from an HVDC systems perspective. Converter transformer leakage reactance is only one component of the commutation reactance. Therefore measurement/ determination of commutation reactance is not within the scope of this equipment standard."

(iv) The issue of Cu S_2 in transformer oils was discussed. Corrosion and deposition of Cu S_2 is a general problem that can affect all transformers. Per Pierre Riffon this problem was first identified in 1995. Pierre has a very recent CIGRE presentation on the subject that he can make available to S.C. members for standards development work. Per one guest at the S.C. meeting the refining process is probably more important than the sulphur content of the crude oil. The consensus is that this issue should not be part of an equipment standard. This issue may be something that the Insulating Fluids S.C. should consider addressing. (Frank Gryszkiewicz).

(v) Table 1 in Annex D covering dissolved gas rate of rise limits during the overload heat run test was discussed. The limit for CH_4 should be changed to <.4 ppm/hr. vs <.1 ppm/hr.). Maximum total values for C_2H_6 and C_2H_4 should be specified vs rate of rise limits. A third column will be added to the table covering maximum total values where applicable. These values are important as more total gas will be evolved during the overload test than during a standard temperature rise test. Note 3 will be modified: "The total amount of C_2H_2 shall be ≤ .1 ppm after all tests. Pierre Riffon, Peter Heinzig and Christoph Ploetner will revise Table 1 and the NOTES; including consideration of Waldemar Ziomek's input. (Waldemar Ziomek will be contacted by e-mail).

(vi) Les Rickseidler's e-mail with his comments to D#4 will be circulated to S.C. members in order to obtain feedback.

The Chairman will produce Draft #5 prior to the Costa Mesa meeting. The meeting adjourned at 3:00 p.m.

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