MINUTES OF MEETING
BUSHING SUBCOMMITTEE
OF THE
IEEE/PES TRANSFORMER COMMITTEE
PITTSBURGH, PA
OCTOBER 8, 2003

7.6 Bushing Subcommittee – Fred Elliott Chair

7.6.1 Introduction/Attendance

Chairman, Fred Elliott opened the meeting at 3:00 PM and welcomed the members and guests. There were 37 attendees with 19 members and 15 guests present. Three guests requested membership to the Bushing Subcommittee.

7.6.2 Approval of Minutes of Last Meeting

The minutes were approved as written.

7.6.3 Chairman's Remarks

The Chair made the following remarks after attending the Administrative Subcommittee meeting.

- The next Transformer Committee meeting will be held in San Diego. March 7 - 11, 2004
- The IEEE Standards Board has approved the continuing use of dual dimensioning where appropriate in IEEE standards documents, with metric units preferred followed by English units in parenthesis. The reason behind this is safety concerns and confusion.
- The Administrative Subcommittee is considering establishing corresponding membership classification for active participants who meet all the committee membership requirements except attendance.
- Recently, there have been a number of unresolved negative ballots on reaffirmations. These ballots slow down the process without adding value. The standard being balloted cannot be changed. It can only be accepted or rejected. Comments are held for consideration during the next revision project. Unresolved negatives trigger a recirculation ballot, which takes time and effort that could be put to better use on other active projects.
- IEEE and IEC have signed an agreement for dual logo standards. At present, IEEE standards, which do not have equivalent IEC standards, can be proposed for adoption in the IEC. IEC votes to accept or reject the proposal. The document cannot be changed. The balloting and acceptance process is expected to take no more than six months. On the other hand, negotiations are underway to establish a reciprocal agreement that would allow the adoption of the IEC documents by the IEEE.

7.6.4 Working Group and Task Force Reports

7.6.4.1 WG - Revision of C57.19.00 - Keith Ellis, Chair

Keith reported that there would be a recirculation as the negative votes could not be resolved. Draft 6 ballot yielded 96 % approval.

7.6.4.2 TF - Revision of C57.19.100 – Keith Ellis, Acting Chair for Tommy Spitzer

The acting TF Chair opened the meeting at 11:00 AM and welcomed the guests. There were 42 attendees with 6 additional requests for membership on the TF. An active membership list will be established before the next meeting.

The agenda was reviewed and the following items were discussed for the proposed revisions to the document.

- Mounting angle greater then 20° as presented by Pritpal Singh was discussed. It was agreed that this item should be included in Draft 1 of the document and that further discussion would be warranted.

- Temperature correction of Power Factor as presented by Mark Rivers was discussed. It was agreed that this should be added to section 10.2, Routine and Special Tests.

- Temperature rise test for draw lead cable as presented by Pritpal Singh was discussed. After some discussion, the acting Chair asked each bushing manufacturer present to review the proposed text and provide their opinion to the Chair one-month before the next meeting.

- Power factor measurement of RG bushings as presented by Lapp was discussed. It was agreed that this information needs to be included in Draft 1 of this document.

- Bushing storage recommendations as submitted by a member were discussed. A great deal of discussion took place regarding this issue and it was agreed that **Keith Ellis** with the help of **Florian Costa**, would make another attempt to include additional information regarding storage of bushings as well as introduce some recommendations for testing bushings in storage. The revised information would be sent to the Chair one month before the next meeting.

Old Business

- At the last meeting it is suggested that applying “Outdoor” bushings indoors could be addressed in the guide. ***Volunteer; Devki Sharma*** (Please submit before the next meeting)

- Harmonize with IEC. ***Volunteer; Keith Ellis*** (Please submit before the next meeting)

- Temperature calculation for short-time loads above bushing rating. ***Volunteer; Chris Monoski*** (Please submit before the next meeting)

- There was continued discussion on DGA of bushing oil. Mike Lau with BC Hydro indicated success in finding bad bushings by taking oil samples and running DGA. The acting Chair indicated that most bushing manufacturers do not recommend oil sampling from “healthy” bushings. If there is continued interest in this subject further discussion could be undertaken within the TF. Nguyen Van Nhi with Hydro Quebec again raised this issue and Nguyen agreed to provide more details on this subject for discussion at the next meeting

New Business

- Bushing repair was suggested for this document. It was agreed that Lapp would put together some recommendations one month before the next meeting and send it to the Chair, Acting Chair and the Secretary.

- A question was raised about the effects of applying on-line bushing monitors to the test and voltage taps of bushings. The person who raised the questions agreed to prepare some information on this issue one-month before the next meeting and send it to the Chair, Acting Chair and the Secretary.

Epilog: The subject matter for discussion is increasing and it is recommended that this TF be expanded to two sessions for the next meeting.

Adjournment

The meeting was adjourned at 12.15 PM.

7.6.4.3 Report of Technical Advisor to IEC SC36A

No report was available on IEC activities

7.6.5 Old Business

7.6.5.1 Reaffirmation of C57.19.03

The Chair will submit a PAR for preparing a corrigendum. Will require a small group to accomplish this task. No information available on IEC standard on DC bushings.

7.6.5.2 C57.19.01- 2000, Tutorial Presentation

A tutorial to make the members aware of this new dimensional standard was given on October 7 by Fred Elliott, Loren Wagenaar, and Mark Rivers. The chair remarked that it will require a long term effort to adopt the new standard.

7.6.5.3 Bulk Bushing Standard

Pat Jostrand presented the following questions:

- Should there be a separate standard for bulk-type bushings?
- Would it better to make changes to the existing standards? What changes would be required to add these to the existing standards?
- Are there existing resources that could be used to develop the new information?

The above questions were discussed in the meeting and it was agreed to form a group that would discuss the requirements of such a standard. The group would be lead by Pat Jostrand. The following attendees volunteered to work in this group.

Larry Davis
Keith Ellis
Bob Hartgrove
Don Platts
Mark Rivers
Pritpal Singh
John Tillman

Please contact Pat Jostrand at pjostrand@warcoinc.com if you are interested in participating in this group.

7.6.5.4 Switching Impulse Requirements

Devki Sharma raised the question of Switching Impulse again at this meeting. He indicated the need for better coordination between the bushing and the transformer standards. The attendees had discussions similar to the one that took place at the Raleigh subcommittee meeting. No agreement was made for any additional work.

7.6.6 New Business

7.6.6.1 Phase to ground Clearances

Pritpal Singh referred to the Dielectric Test Subcommittee meeting where there was discussion to include Phase to Ground clearances for transformers in the C57.12.00 standard. It was mentioned that Line to Ground clearances (Arcing Distance) is dependent upon individual designs and vary between manufacturers. Having such a requirement would create a lot of confusion for bushing requirements. Bushing standards do not have such a requirement. Loren Wagenaar (Chair SC Dielectric Tests) agreed to include a **Note** to exclude bushings from this requirement.

7.6.7 Adjournment

The meeting was adjourned at 4:10 PM

Minutes Submitted By,

Pritpal Singh, Secretary
Bushing Subcommittee