

**MINUTES OF MEETING  
BUSHING SUBCOMMITTEE  
OF THE  
IEEE/PES TRANSFORMER COMMITTEE  
MEMPHIS, TN  
OCTOBER 27, 2005**

**7.9 Bushing Subcommittee – Fred Elliott, Chair**

**7.9.1 Introduction/Attendance**

Pritpal Singh - Acting Chair opened the meeting at 3:00 PM and welcomed the members and guests. There were 56 attendees with 21 members and 35 guests present. Six guests requested membership to the Bushing Subcommittee.

IEEE patent policy was addressed and no patent conflicts were reported.

**7.9.2 Approval of Minutes of Last Meeting**

The minutes of last meeting in Jackson, MS were approved as written.

**7.9.3 Chairman's Remarks**

Peter Zhao – Secretary attended the Administrative Subcommittee meeting on Sunday afternoon on behalf of the Chair. He passed the following remarks to the attendees during the Bushing Subcommittee meeting;

- 2006 Spring Transformer Committee meeting will be held on March 19-23 in Hilton Costa Mesa, California, hosted by Bill Chiu and SCE. Hotel on-line reservation is available. Technical tour ( Sylmar HVDC Converter Station) will be scheduled Sunday Morning, March 19,06.
- Four IEEE-SA personnel attended the meeting in searching for future service improvement. The members were encouraged to provide their concerns and suggestions to the IEEE-SA, and they were welcome to participate in Monday Lunch Mtg – Standards Development Process since some changes or improvement have been made for the process.
- For PAR extension approval, the explanation and time schedule would be needed.
- The Committee WiFi connection was available for the members, contacting Craig Stiegemeier if any questions.

**7.9.4 Working Group (WG) and Task Force (TF) Reports**

**7.9.4.1 WG - Revision of C57.19.00 - Keith Ellis, Chair**

The WG has been finished for now and the Standard is ready for publication. No meeting was arranged.

#### **7.9.4.2 TF - Revision of C57.19.100 – Tommy Spitzer, Chair**

The Chair called the meeting to order on Oct. 25, 2005 at 11:00 AM with 21 members and 31 guests, 6 requested for membership. The members and guests were introduced.

Bob Hartgrove resigned from the Secretary position and Charlie Caruso agreed to take over.

There were no patent disclosures.

The minutes of the Jackson meeting were approved as written.

Under old business, the difference between draw rods and draw leads were discussed. It was agreed that a generic definition would be developed, which will be acceptable to the manufacturers and will include an explanation as to how current is carried for each application.

Under new business, it was determined that an additional section is needed to explain what issues and hazards can be encountered when replacing obsolete bushings with newer designs. It was also suggested that a checklist should be developed to show what information would be needed by a manufacturer to provide a suitable replacement. It was also suggested that we check for co-ordination with IEC even though this guide only applies to ANSI bushings.

The TF has made a considerable progress. The proposed schedule is to have a PAR approved and draft 1 completed before the next meeting.

The meeting was adjourned at 11:45 am.

#### **7.9.4.3 TF – Bulk Bushings – Bob Hartgrove, Chair**

No mtg / report.

#### **7.9.4.4 C57.19.03 Corrigendum 1 – DC Bushing Standard – Fred Elliott, Chair**

There was no TF meeting but Chair submitted the following information through e-mail;

- The re-circulation ballot, which closed on October 14, 2005, yielded 75% returns with 100% affirmative votes.
- The project was submitted to the Standards Board on October 17, 2005. Fred has conveyed his Thanks to John Graham, Pierre Riffon, and Lars-Erik Juhlin for their participation.

#### **7.9.4.5 IEC Bushing Standards Activity - John Graham of Trench Ltd., UK**

John Graham reported as following;

### **IEC BUSHING STANDARDISATION WORK**

Within IEC, standardisation of bushings is covered by Technical Committee TC36: Insulators, Subcommittee SC36A: Insulated Bushings.

Subcommittee officers are:

Chairman: Lars Johansson, ABB, Sweden.

Secretary: Alberto Sironi, CESI, Italy.

The last meeting of SC36A was held at the IEC General Meeting in Rosslyn, Virginia, on December 9<sup>th</sup> 2004. The next meeting will be Berlin, Germany in October 2006. There is one active working group:

**SC36A MT5: IEC 60137: Insulated bushings for alternating voltages above 1kV.**

Project Leader: John Graham, Trench-UK.

Although IEC 60137 Edition 5 was just published in August 2003 due to adverse comments received from the IEC transformer committee TC14 work was immediately restarted. A Committee Draft (CD) was distributed for comment by National Committees in July 2004 and was discussed in Rosslyn. Most comments were accepted, but progress has been slow during 2005.

As reported previously TC14 would prefer that all dielectric tests on to the transformer have been applied to the bushing, with a margin of 10%. Bushing manufacturers consider this procedure has no technical or economic justification and if the margin is required then bushings of a higher rating should be purchased. A compromise has been reached in the MT to have impulse testing as routine on all transformer bushings 245kV and above and extended type test below this level.

It is expected that a Committee Draft for Vote (CDV) will be issued at the end of October 2005 with a target Final Draft International Standard (FDIS) in May 2006.

**Other Work**

**SC36A MT67: IEC 61464: Dissolved gas analysis of bushings.**

This new maintenance team will be set up to review the document published in 1998. This gives information on interpretation of DGA specifically for bushings. There have been issues with TC10 on the scope and whether this work should be included in IEC60599. No work yet.

**SC36A MT7: IEC 61463: Seismic qualification of bushings.**

This new maintenance team will be set up to review the document published in 1997. This offers a more simplified approach to qualification than IEEE 693, allowing static calculation. No work yet.

**CENELEC TC36A WG4 prTS50458: Capacitance graded outdoor bushings 52 up to 420kV for oil filled transformers**

CENELEC is the European parallel committee for IEC and produces standards or harmonisation document for use in the European Community. This document gives dimensional standardisation for transformer bushings. A Final Draft was circulated in July 2005 and comments submitted at the end of September. The result of the vote is not yet known.

**7.9.5 Old Business**

- Reaffirmation of C57.19.01– Bushing Performance Characteristics and Dimensional STD

Chair Fred Elliot submitted the following information through Email.

The Reaffirmation Ballot status as of October 17, 2005 indicated the following:

81 % returned  
94 % affirmative

The ballot closed on October 23, 2005.

#### **7.9.6 New Business**

Discussion of Future Activity on the Revision of C57.19.01 – 2000

- The negative ballots received during the reaffirmation process of C57.19.01 were discussed. Two of these pertain to reference to 1991 standard for dimensional information on ratings withdrawn from 2000 standard. This will be discussed with the standards people and see how we can resolve this issue.
- The other three pertain to dropping of 25, 115, and 161 kV ratings.
- The acting chair explained the background, benefits, and the revision process. Also, it was mentioned that technical papers were written and a presentation was made at the Doble Client's for educating the users and manufacturers
- A suggestion was made by Loren Wagenaar to consider publishing a similar paper in the T & D magazine. This appeared to be a good idea. We will ask the original contributors for their interest.
- The members and guests present did not show any interest in bringing the obsolete ratings back into the standard.
- It is expected that further discussions will take place as more comments are received.

No other new business was brought up at the meeting.

#### **7.9.7 Technical Papers**

No activity was reported for this mtg.

#### **7.9.8 Adjournment**

The meeting was adjourned at 3:45 PM.

Minutes submitted respectively by,

Peter D. Zhao

Secretary  
Bushing Subcommittee