Insulating Fluids Subcommittee – F. J. Gryszkiewicz, Chair; R.K. Ladroga, Vice-Chair

Submitted By Richard Ladroga
November 3, 2005

Introduction/Attendance
The Insulating Fluids Subcommittee met in Memphis, Tennessee on Wednesday, October 26, 2005 with 23 members and 27 guests present.

Approval of Meeting Minutes

The Minutes of the Jackson, Mississippi meeting were approved as written.

Subcommittee Membership

There were no changes to report in the Subcommittee Roster.

Current Subcommittee Business

C57.106 – IEEE Guide for Acceptance and Maintenance of Insulating Oil in Equipment

The Working Group for the revision of the IEEE Guide for Acceptance and Maintenance of Insulating Oil in Equipment (or IEEEC57.106) met at Memphis, Tennessee on Tuesday October 25, 2005. There were 4 members and 34 guests. A request for any patent disclosures received no response. After review of the draft minutes of the previous meeting on March 15, 2005 - a motion was made and seconded to approve those minutes. The approval was unanimous. Then the previously suggested changes to draft 4 were presented as draft 5. A copy of draft 5 was presented in Power Point and hard copy and there were no objections, changes or comments. It was announced by the Chair that this was the last PC57.106 Working Group meeting and that the entire revision document for draft 5 has been sent to IEEE headquarters for editorial review and that balloting should start in 30 days. The Chair and all members and guests gave a thank you to TV Oommen for his assistance and expertise on the technical issues regarding moisture diffusion in transformer materials.

Respectfully submitted,

Jim Thompson, Chair PC57.106 Working Group
TV Oommen, Vice Chair PC57.106 Working Group

C57.104 – IEEE Guide for the Interpretation of Gases Generated in Oil – Immersed Transformers

A Standards Association Ballot was recently conducted on Draft 11D. Sixteen negative ballots were received. The Working Group previously had agreed to participate with IEEE Headquarters in an experimental procedure where negative ballots will be resolved or rebutted via a website based and teleconferencing procedure. A ballot resolution team was set up to begin work on the resolution process. This team consisted of Joe Kelly, Sue McNelly, Tom Prevost, and Richard Ladroga.

The group addressed the negative ballots and presented their resolution(s) to the IEEE staff present at the Memphis meetings. Upon a review of the negative ballots and outstanding issues,

the IEEE advised the ballot resolution team, Insulating Fluids Subcommittee, and IEEE PES Transformers Committee Chair, Vice-Chair, and Secretary that the Guide and its resolutions would not pass through REVCOM.

The C57.104 Guide was last approved in 1991. The new PAR was applied for and received in 1996. The Working Group did not complete the revision to the Guide by 2000, and an extension was sought and received at that time. Additional extensions were applied for and granted in 2002 and 2004. The group discussed the lengthy period that this Guide has been in a revision status without receiving approval, and noted that another extension would be difficult to secure. The group felt that another extension would not be a viable solution to complete the Guide, resolve the outstanding issues, and achieve a successful ballot.

Therefore the group decided to take the following action, with the understanding and approval of IEEE representatives Angela Ortiz and Jodi Haasz:

Allow the current PAR for C57.104 to expire at the end of December 2005.

Apply for a new PAR using the same title and C57.104 designation. Tom Prevost and Richard Ladroga agreed to complete the application and submit it to the IEEE. Richard Ladroga volunteered to Chair the new Working Group.

Allow the current Guide, namely C57.104 – 1991 to expire. This action is being undertaken as a result of discussion among the group. The 1991 Guide is no longer considered valid, and should consequently be removed from circulation as a valid Guide. The group, the Transformers Committee leadership, and the IEEE representatives also felt that this action would serve to draw attention to this vital document, and help to rally interest and a strong effort to complete a new Guide as soon as possible.

A new Working Group will form, and the new Chair will work to prepare the new Guide draft for review at the next meeting in Costa Mesa.

Respectfully Submitted
Richard K. Ladroga
October 28, 2005

C57.130 – Trial Use Guide for the Use of Dissolved Gas Analysis During Factory Temperature Rise Tests for the Evaluation of Oil- Immersed Transformers and Reactors

There is nothing new to report on this guide.

C57.139 – IEEE Guide for Dissolved Gas Analysis of Load Tap Changers

The meeting was called to order by Fredi Jakob at 8:05 am, Tuesday, October 25, 2005. There were 17 members and 24 guests present with 4 guests requesting membership.

Guests requesting membership were:

Tim Reynolds
Shuzhen Xu
Alan Padgett
Don Angell

The IEEE Patent disclosure requirements were discussed and a request was made for disclosure of any patents that may be related to the work of the WG. There were no responses to the request for disclosure.

Agenda:

1. LTC Types, let by Mr. Dave Wallach, Duke Energy
2. A review of the type document prepared by the sub-committee.
3. Paragraph by paragraph review of draft 8
4. Setting goals for the Spring 2006 meeting

Approval of minutes from the March meeting was requested. A motion was received and the minutes were approved.

Agenda Items 1 & 2:

Dave Wallach discussed the LTC Type table that he provided as a proposed table for the standard. Dave opened the table up for discussion. The committee will have to have a "cheat sheet" to initially populate the data that would have LTC types listed. This would not be put in the standard, but would be used to develop the generic table to assure that the LTC types are appropriately matched into the generic table.

Fredi requested volunteers to help start populating the table. Tim Raymond indicated that he has a partial list that he can provide.

There was discussion regarding whether there are enough breakdowns in the type table to cover both reactive and resistive LTCs. The data will be collected with the reactive and resistive types identified. Once the table is populated, then we can look at the ratios for these units to see if they can be combined into one category or if they will have to be left as separate categories.

David provided histograms of data he has collected for different LTC ratio distributions. A comment was made that wasn't that what we were going to do with the data we collect? Take the data and develop histograms or norms to help us determine how to group the LTC types and expected ratios.

Fredi will remind George Forrest that he would put together a database query. This would then be sent out for a more uniform collection of data.

Paul Bowman from Hartford volunteered to provide some data.

Data fields that are needed are as follows:

- Gases (CO, CO2, Hydrogen, Methane, Ethane, Ethylene, and Acetylene)
- Sample dates
- Manufacturer, type, model #, and year
- Classification of the LTC per the WG LTC Type table.
- Operation count at each sample date
- Breathing configuration (free breathing or sealed)
- On line filters? If filtered when filter was installed and changed
- Date LTC installed
- Problem investigated
- Compartment origin of sample

Agenda Item 3:

Fredi asked for a consensus on how to proceed to try and make the work on this as efficient as possible. Do we want to proceed in the meeting on a paragraph-by-paragraph review or do an offline collaboration of review and updates?

Comments that a smaller group effort would probably be the best option and then put that forth for comment and review by the WG.

The original document was started by Rick Youngblood, and needs more input into further development.

Volunteers to help with this are Rowland James, Bengt-Olof Stenstam, Jim Gardner, and Tim Raymond.

Reviewed the document outline and asked for comment on whether there were any obvious omissions that should be added.

Fredi asked for any volunteers that have before and after filtration data. Tommy Spitzer indicated that they have not seen any difference in the ratios of their LTCs before or after using on-line filtration. Jim Gardner and Tommy Spitzer will provide some data of their findings. Comment that whether the unit was a free breather or sealed unit should be identified.

Question was asked on whether particle count and size distribution would be included. Fredi commented that this document will primarily deal with DGA, but should mention that these other methods of diagnostics are available.

Fredi indicated that we would have a Draft 9 available for the next meeting

The meeting was adjourned at 9:08 am.

Fredi Jakob
Chair

C57.146 – IEEE Guide for the Interpretation of Gases Generated in Silicone Immersed Transformers

This document previously carried the IEEE designation P1258. This has been changed to the IEEE designation C57.146 to be consistent with the other standards in the C57 collection.

Jim Goudie and Bill Bartley are the Working Group Co-Chairs of this project. The Standards Association Ballot was conducted with a favorable outcome, and the Standard Board approved the Guide on September 21, 2005.

C57.147 – IEEE Guide for the Acceptance and Maintenance of Natural Ester Based Fluids

Tuesday, October 25, 2005
Memphis, TN
Minutes of WG Meeting

The WG meeting was called to order at 9:30 am, on Tuesday, October 25, 2005 by the working group Chair, Patrick McShane. Vice Chair, Clair Claiborne and Secretary, Susan McNelly were also present. There were 18 members present and 56 guests, with 7 guests requesting membership. Guests requesting membership include:

Thomas Callsen
Dan Morgan
Joseph Cultrera
Roberto Asano, Jr.
John Lackey
Saurabh Ghosh
Bill Griesacker

As required in IEEE SA Standard Boards by-law, Section 6.3.2, the IEEE patent disclosure requirements were discussed and a request was made for disclosure of any patents that may be related to the work of the WG. No new disclosures were forthcoming.

The minutes for the Spring 2005 meeting were approved as submitted and recorded on the website.

A special recognition was paid to Ms. Susan McNelly for service above and beyond the call of duty despite her recent adversity and injury.

Draft 6 was issued for a straw vote to the working group and the subcommittee for comments. Several dozen technical and editorial comments were reviewed by the Task Force executive staff and were incorporated into a new Draft 7 which was issued just prior to this meeting and posted on the website.

The rest of the meeting consisted of review of certain points of this latest Draft 7, of the Guide. The following were discussed:

T. V. Oommen submitted that section 4.14 should address an issue that dealt with the concept that highly monosaturated oils with suitable antioxidants ought to be mentioned in the guide. His position is that only such oils have the oxidation stability to be satisfactory for continued use.

Patrick McShane stated that no monitored field installed transformers with at least 9 years service have shown no sign of polymerization, and an experimental operating unit purposely free breathing and thermally cycled has shown only slight increase in viscosity over the last 8 years, indicating that this is not a significant issue.

Another attendee suggested the guide should describe why vegetable oils have a lower gassing tendency than mineral oils. T. V. Ooomen stated that the reason for this is that vegetable oils are typically unsaturated and thus can absorb hydrogen more readily. It was agreed to put typical ranges for the gassing tendency of vegetable oils in the text of the next draft, but not to specify these limits in the property tables.

The discussion of oxidative stability resumed briefly. A task force consisting of several members and guests was formed to attempt to resolve this issue:

Patrick McShane
Jerry Murphy
T. V. Oommen
Gale Kennedy
Bill Griesacker

Mr. McShane reviewed a change to Table 2 which was made to limit the moisture content to 400 ppm in tankers and 100 ppm in drums and totes. The rationale for this is that tankers are usually delivered and processed before installation into transformers while drums and totes are used without further processing and can be applied for all voltage classes. This change drew positive comments.

Mr. McShane also mentioned the inclusion of Appendix A3 which describes the Doble Power Factor Valued Oxidation test which is a alternative to measure oxidation stability which uses air rather than pure oxygen used in the ASTM methods. Lance Lewand advised that Doble Engineering would have no objections including the reference in this standard guide. Northern Iowa University biobased industrial products research division, ABIL, is also working on measuring relative oxidative stability of biobased hydraulic and lubricating oils and may be a resource in this area.

When the comments on draft 7 are gathered by the end of this year and the work of the task force is completed, the next draft will be forwarded to IEEE by January 31, 2006 for the official ballot process.

Respectfully Submitted

Patrick McShane
Working Group Chair
October 25, 2005

Adjournment

The Subcommittee adjourned at 12:00 noon.

Next Meeting

The Insulating Fluids Subcommittee and its Working Groups will next meet in Costa Mesa, California during the period of March 19-23, 2006.