

Annex B Dielectric Tests Subcommittee

November 1st, 2017
Louisville, Kentucky

Dielectric Tests Subcommittee		
Chair: Ajith M. Varghese	Vice-Chair: Thang Hochanh	Secretary: Poorvi Patel
Room : Marriott 5+6	Date : November 1 st , 2017	Time: 11:00 am to 12:15 pm
Members : 133	Present at time of checking : 93	Present per attendance roster & recorded to AM System: 93
Guests present : 133	Membership requested : 20	Membership accepted: 17

B.1 Chair's Remarks

The Chair briefly highlighted the requirement that while introducing one need to state their employer/ company and sponsor if difference from company. Chair also reminded that IEEE and transformer committee are non-commercial organizations and standards shall focus only in developing performance and functional requirement and not design and construction details.

The Chair reminded all attendees to have updated information, such as email address, in the AM system as for all correspondence this system is used. Regarding the AM system, Sue McNelly is looking for an IT interested individual that can help to upgrade and update the AM-system.

The Chair clarified the Ballot resolution process. Often a smaller resolution group is formed and the comments are resolved by conference calls and TF during meetings. It's important that once all the ballot comments are resolved the document is circulated to the WG for a final approval before re-submitting it to the subcommittee for approval.

The Chair reminded the WG and TF leaders to submit their minutes from the meetings within 30 days to the SC chair and secretary. The SC Secretary then has to submit the SC minutes within 45 days of the SC meeting. To minimize revision and errors in the sub-committee level and transformer committee level minutes please send the final version of your minutes.

The Chair reminded to start every meeting, conference calls if there are any patents that are known to be applicable for within the area of WG scope. If yes, patent claim type should be noted but not discussed at the working group meetings. Calls for Patents is not required for TF.

The Chair shared details of upcoming PES sponsored meeting as well as details of next transformer committee. IEEE PES T&D Expo in April 16-19 of 2018 in Denver, CO, USA and the next IEEE PES General meeting – Aug 5-9: Portland, Oregon, USA. The next transformer committee will our 100th Anniversary meeting from March 25th to March 29th, 2018 in Pittsburgh, Pennsylvania. There will be a Sunday 100th anniversary banquet with fun entertainment, so please plan for this event. The fall meeting 2018 will be held in Jacksonville, Florida 14th -18th of October 2018.

The Current Status of PARs was presented by The Chair. C57.161 Guide for DFR Measurements is currently under ballot resolution process the par expires December 2017 and an extension was submitted.

The Par was approved for one year extension to 2018. Par for C57.12 Guide for the Detection of Acoustic Emissions from Partial Discharges in Oil Immersed Power Transformers expires in 2018 and there is a risk that revised guide will not get released before current standard is moved to inactive-reserved status. The document is now ready for going to ballot that will be decided to do so in this meeting. C57.113 Recommend Practice for Partial Discharge Measurement in Liquid-Filled Power Transformers and Shunt Reactors a PAR has been submitted and will be taken up in the December meeting for approval. A new working group will be formed in Pittsburgh in spring 2018. All other pars are in good order.

The Chair reminded the WG on attendance requirement for new membership and for continuation and the requirement to have attendance updated in AM system i.e. to attend two out of last three meetings or three out of five last meetings.

The secretary presented the new members and welcomed them to the subcommittee. 24 guests had requested membership in the last meeting in New Orleans and 19 where accepted. 9 members where changed to guest status for not regularly attending meetings.

B.2 Quorum, Approval of Minutes and Agenda

The membership list was shown and a show of hands of committee members present showed that a quorum of members were in attendance at the start of the meeting. 93 out of 133 members were present, so there was a quorum.

All attendance is recorded in AM System. Per verification of roster 93 members and 119 guests attended the SC in Louisville Kentucky.

The agenda was presented by the chair and it was unanimously approved.

The minutes of the Spring 2017 meeting at New Orleans meeting was approved unanimously.

B.3 Taskforce and Working Group Reports

B.3.1 TF on External Dielectric Clearances

Eric Davis, Chair; Troy Tanaka, Secretary

The Task Force on External Dielectric Clearances met on Monday October 30, 2017 at 9:30 AM in the Louisville Downtown Marriott. There were 48 people in attendance; 11 of 18 members, and 37 guests. Five guests requested membership, but will not be granted membership because the task force activities are coming to an end. A quorum was achieved. The full attendance record is available in the AM System.

The meeting agenda and spring 2017 meeting minutes were unanimously approved.

In response to a previous survey comment, the task force discussed the proposed external clearances for switching impulse. The chairman presented a chart showing 4 different sets of clearances: 1) the IEC clearances, 2) the CSA clearances, 3) the 50% withstand clearances, and 4) the 90% withstand clearances. The Task Force discussed using the IEC values, the 50% values and the 90% values. After some discussion, Dan Sauer moved that the curve representing the 90% withstand clearances be included in the proposed table and include notes with formulas and assumptions used in determining the 90% withstand clearances. Ajith Varghese seconded the motion. After discussion, the task force voted with 8 in favor of the motion, 1 against the motion, and 1 abstention. The motion passed. In addition, the chairman took a straw ballot of non-members. The straw ballot was roughly 2/3 in favor of the motion and 1/3 against the motion.

The chair will send the text, table, and backup information to the Dielectric Test Subcommittee, with a request to send out a survey.

Finally, the chair asked for volunteers to validate the formulas and resulting values as shown in the table, prior to sending out the survey. Dan Sauer and David Wallace volunteered.

Dan Sauer moved to adjourn the meeting. Ronnie Minhaz seconded and the meeting was adjourned.
Chair
Eric Davis

Eric Davis, WG Chair, placed a motion to send out a survey with revised values to the subcommittee members. Second motion- Dan Sauer. None oppose. The motion was unanimously approved.

B.3.2 WG on Dielectric Frequency Response Analysis (DFR)

Ali Naderian, WG Chair; Peter Werelius, Vice Chair, Poorvi Patel, Secretary

Summary of activities of C57.161 WG this year:

Draft D.2 was sent for balloting January 15 2017

C57.161 DFR D.2 was 91% approved with a response return rate of 78%.

The WG approved formation of “ballot resolution group” May 14 2017.

The ballot resolution group formed to go over 165 comments received. 30% technical 70% editorial.

On 28-Sep-2017 the IEEE-SA approved the PAR extension request until 31-Dec-2018.

Draft D.3 will be circulated to the WG members within 2-4 weeks from now to get the approval by email for the second round of balloting.

Upon approval of the WG members, D.3 draft will be submitted for re-balloting.

B.3.4 TF on Revision of Impulse Tests
Pierre Riffon, Chair; Daniel Sauer, Vice-Chair

The TF met on October 31, 2017, from 4:45 pm to 6:00 pm. Twenty-five (25) members and fifty (50) guests attended the meeting. Nine (9) guests requested membership but only 5 are eligible to become members. The meeting was chaired by Pierre Riffon, chair of the TF. Mr. Daniel Sauer was the vice-chair.

Attendance has been recorded in the AM system.

Required quorum was met, presence of at least 23 members was required. Twenty-five members were present. The TF membership and guest roster has been reviewed after the New Orleans meeting and members who did not attend the last three meetings were moved as guests.

Revision 2 of the agenda has been approved unanimously.

The Vancouver and New Orleans meeting minutes were approved as written by all members present.

The first item of business was related to the proposal of modifications to clause 10.3.1.3 of C57.12.90 concerning chopped-wave tests. This proposal was sent as third survey within the TF and within the Dielectric Tests Subcommittee membership and guests. Since then, some editorial changes have been implemented by changing the words "chopping time" by "steepness of voltage collapse". The revised proposal is making full consensus within and will be sent to Steve Antosz for inclusion in the next revision of C57.12.90.

Under New Business, four subjects were discussed:

- Stabilizing and tertiary winding terminals status during lightning impulse tests;
- Neutral terminal(s) status during lightning impulse test on line terminals (impedance grounded neutral, floating neutral);
- Tap changer position during switching impulse tests;
- Use of the voltage function during lightning impulse tests.

For the stabilizing and tertiary terminals status during lightning impulse tests, the Chair made a preliminary proposal mainly to see if the principles can be accepted. Tertiary terminals have to be treated as line terminals during lightning impulse tests while stabilizing winding terminals shall be in the same condition as in service even if all three phases of the stabilizing winding are brought out only for testing purposes. The corner that is normally closed and grounded during service shall be closed and grounded during

Louisville, Kentucky, USA;

Unapproved meeting minutes;

Task Force on Revision of Impulse Tests.

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impulse tests. Open terminals of the stabilizing windings shall be let in open circuit during impulse tests even if they are temporary brought out from the tank for test purposes. A revised proposal from the TF Chair will be surveyed to the TF members and guests prior to the next meeting.

Neutral terminal(s) status during lightning impulse tests on line terminals (grounded, impedance grounded neutral, floating neutral) has been discussed. The actual text of C57.12.90 seems to be clear enough and, for the time being, does not need to be changed. No further actions from the TF are necessary.

Regarding the tap changer position during switching impulse tests, the Chair made a preliminary proposal that the tap position shall be such that the maximum turn-to-turn voltage is achieved. The wording of proposal will be improved and a modified proposal will be surveyed within the TF prior to the next meeting.

Finally, Mr. Thang Hochanh did ask if the test voltage function as defined in IEC 60060-1 and in IEEE Std 4 is in use in USA. Mr. Hochanh is the Convenor of the MT responsible of the revision of IEC 60076-4 (Impulse test guide). Some problems of using the voltage function have been identified in his MT. For the time being the TF is not taking any actions until the work of the IEC MT is completed.

The meeting adjourned at 6:00 pm on October 31, 2017. The adjournment motion was made by Mr. S. Som and was seconded by Mr. A. Bolliger.

The next meeting is planned to be held in Pittsburgh, PA, on March 27, 2018.

Pierre Riffon P. Eng.

TF Chair

B.3.5 TF on Revision of Low Frequency Tests

Louisville, KY – October 31, 2017, 1:45 p.m., Chair: Bill Griesacker, Vice Chair: Daniel Blaydon, Secretary: Myron Bell

There were 118 attendees, 36 of 52 members and 80 guests were present at the meeting; 20 guests requested membership, 12 were granted. More than 50 % of the working group members were in attendance at the meeting, therefore a quorum was present.

1. The meeting was called to order at 1:45 PM followed by introductions.
2. Attending members were counted and quorum was verified.
3. There were no objections to unanimous approval of the agenda.
4. There were no objections to unanimous approval of the meeting minutes from the 2017 Spring meeting in New Orleans.
5. Old business
 - a. Tap changer position during induced test (survey results).
Bertrand recently issued a new draft of the proposal taking comments into account. The results of the survey will be summarized for the task force.
 - b. Applying pressure inside a transformer tank during induced test (survey results)
Steve Antosz will submit a new proposal concerning the application of pressure during factory PD testing. This proposal will be surveyed before the next meeting.
 - c. Alternative Applied test method for HV Delta windings.
Chair will approach SC about forming a group to develop a Guide for Low Frequency Dielectric Test Guide document.
 - d. Gassing issue for certain types of transformers with wound cores: proposal for new design test
Phil Hopkinson’s recommendations concerning gassing Issues for certain types of transformers with wound cores will be distributed to the task force. This will be discussed at the next meeting.
6. TF PD Factory Limits report by Vinay Mehrotra

Two motions were made to accept IEC PD limits and both failed. There were calls for more study to justify reducing PD limits. The TF will conduct a survey to better understand what will be accepted changes to standards for PD limits.

7. New business
 - a. PD in bushings during factory testing.
A study group will be formed to provide a recommendation if there should be additions or changes to standards or guides to address this topic. Users, transformer manufacturers joined but no bushing manufacturers joined. The chair asked the bushing committee for bushing manufacturers to join the study group and three volunteers joined..
 - b. Test voltage source measurement for low frequency test–
Bertrand Poulin identified a gap in the transformers standards based an IEEE Std. 4 requirement that each apparatus standard define the value of the test voltage for alternating voltage as the “peak value divided by $\sqrt{2}$, or the rms value as defined by the relevant apparatus standard”. Bertrand provided a recommendation to add text to provide this definition. Bertrand’s proposal will be provided in the form of a survey to the task force.

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B.3.6 WG - IEEE Guide for the Detection of and Location of Acoustic Emissions from Partial Discharges in Oil-Immersed Power Transformers and Reactors (C57.127)

Chair: Detlev Gross Chairs Vice Chair: Jack Harley Secretary: David Larochelle

Louisville, KY, October 31 2017

Room: Marriott 1-3

Meeting Attendance

The working group met at 11:00 AM. 78 persons were in the room and 15 members out of 23 were present. Quorum requirement was met. Complete attendance record is available in the AM System.

Discussions

The meeting started with the unanimous approval of the agenda (Thang Hochanh, seconded by Hemchandra Shertukde). The minutes from New Orleans meeting were also unanimously approved (motion by Hemchandra Shertukde, seconded by Thang Hochanh).

A patent was brought to our attention during the call for patent. The new information relates to the addition of the Hinckley energy criterion to the Annex B or the guide (informative). The patent number is: US7286968 B2 and is owned by Areva T&D (now GE). We understand that IEEE SA will analyse this. In

case it conflicts, we will either drop this section or solve it by having GE providing the “letter of assurance for essential patents”.

The main discussion of the meeting was about a comment regarding the differentiation of the two main methods (all-acoustic and using electric trigger) and their respective level of detail. Although the guide already covers both methods, it was proposed that more insight regarding the mathematical determination of time of arrivals could be useful. It was mentioned that the main objective of this guide is to educate users on the principles of acoustics and to bring background information on the different techniques that exists on the market. Having many details on the mathematical implementation of the different algorithms involved in these solutions is not considered as valuable information to be detailed in the guide, but could be included as a reference in the bibliography. Raja Kuppuswamy made a motion to include further information on the all acoustic technique. No members voted for the motion. The motion failed.

We then had a motion to approve the current draft in order to initiate the sponsor ballot process after the Mandatory Editorial Coordination (Motion by Hemchandra Shertukde, seconded by Marco Tozzi). The motion was unanimously approved.

The group will meet again in Pittsburgh for the spring 2018 meeting.

Adjournment

The meeting was adjourned at 11:50 AM.

David Larochelle

Motion was put on the floor by Detlef Gross (WG Chair) to submit the document for ballot. Second motion was made by Alexander Kraetge. None oppose. The motion was unanimously approved. This document will now be submitted for first round of balloting.

B 3.7 Working Group for PD in bushings, PTs and CTs – PC57.160**WG Secretary: Thomas Sizemore; WG Chair: Thang Hochanh****Meeting Minutes October 30, 2017 at 4:45 – Louisville, KY****Attendees:** 68**Members attending:** 20/33 - Quorum requirements were met.**Rosters:** Circulated for members and guests.**Agenda:** An agenda was presented and approved without objections for the meeting.**Essential Patent Claims:** Text was displayed and the Chair inquired as to if anyone knew of essential patent claims. None were brought up during the meeting.**Minutes:** Minutes were approved due for the Vancouver and New Orleans meetings. Motion to approve by David Wallace and this was seconded by Detlev Gross.**Items discussed based upon comments received:**

A number of comments were received from 2 attendees for discussion as noted below.

Comments discussed from Robert Middleton:

- Under **Keywords** both voltage transformer and potential transformer appear. The text in the standard only refers to voltage transformer. – The unused keyword will be removed.
- Under **Normative References** IEC 60270 appears twice. – The second reference will be removed.
- Under **6.3.1** specific ranges are given for C1, C2 and C3. Large variations are possible for these capacitances. We see no need to specify a range. – This was previously discussed in the working group. The values given are as a typical reference, other values are possible. No change is to be made.
- Annex **C** needs more editing to improve the English. Also better referencing of the Figures is needed. - References will be updated. A review of the English used will be made for grammatical type issues.
- Clause **C2 in Annex C** references Annex 2 Figure 1.a? - Will be updated.

Comments discussed from Raja Kuppuswamy:

- Comments were mostly related to PD monitoring with online equipment which is a valid technique but outside of the scope of this guide.

Additional items discussed:

A motion was made to move this guide into the balloting process. A motion was made by David Wallace and was seconded by Shibao Zhang. The motion was accepted at the working group level.

Motion to adjourn: A motion was put forth by Marek Kornowski and was seconded by David Wallace.**Spring meeting 2017:** This WG may not meet at the spring 2018 meeting as this guide should be in the ballot resolution process.**Next version of draft:** Actual draft is technically correct, except some last editing corrections addressed this week. We submit to the IEEE ballot process after getting the agreement of the concerned Subcommittees (Instrument Transformers, Bushings and Dielectrics Tests).

Date: 2017-30-10
 Chairman: Thang Hochanh
 Secretary: Thomas Sizemore

Motion was put on the floor by Thang Hochanh to submit the document for ballot. Second motion was made by Pierre Riffon. None oppose. The motion was unanimously approved. This document will now be submitted for first round of balloting.

**B 3.8 Task Force Winding Insulation Power Factor & Winding Insulation Resistance Limits
Diego Robalino (Chair) and Aniruddha Narawane (Secretary) at the meeting
Tuesday 10/31/2017, Louisville, KY.**

Meeting initiated at 08:00 AM at the Marriott 1-3, Marriott Louisville Downtown, Louisville, KY USA
Diego Robalino (Chair) and **Aniruddha Narawane** (Secretary) at the meeting

Meeting started with introduction of attendees

At the beginning of the meeting, 15 members were in the room out of 44 total members listed. Quorum was not established however after a while 7 more members joined the meeting completing quorum requirement to continue with the agenda.

- Data collected from Meeting Roster
 - Activity Name: TF Winding Insulation PF/Resistance Limits
Activity ID: 2186
Number of Members in Activity = 44
Number of Members Present = 23
Quorum Present = 52.2%
Number of attendees = 68
- TF Members not attending for 3 consecutive meetings were revoked membership and listed as guests

Number	Last Name	First Name
1	Yeboah	Kwasi
2	Robins	Kirk
3	Hochanh	Thang

- TF Guest who previously requested membership and were granted

Number	Last Name	First Name
1	Ghosh	Rob
2	Bolar	Sanket
3	Foschia	John

- TF Guests requesting membership in this TF

Number	Last Name	First Name
1	Dorris	Don
2	Salva	Jose
3	John	John
4	Joshi	Akash
5	Martinez	Rogelio

- Agenda
 - Introductions
 - Attendance headcount
 - Approval of agenda

- Announcements regarding Chair and Secretary positions
- Approval of Spring 2017 meeting minutes
- Report on survey table conference call
- Task Force Report Comments review.
- Any new topic for discussion.
- To review and recommend Accuracy requirement for power factor test defined under C57.12.90 – 10.10.2. Discussions from meeting is included in DTSC minutes.
- Meeting Adjourn
- Any new topic for discussion.
- To review and recommend Accuracy requirement for power factor test defined under C57.12.90 – 10.10.2. Discussions from meeting is included in DTSC minutes.
- Meeting Adjourn
- There was unanimous approval of agenda
- There was unanimous approval of Spring 2017 New Orleans meeting minutes (Motion by Poorvi Patel, Seconded by Ajith Varghese)
- Diego mentioned that due to other commitments, Susmitha has requested to be relieved from Chair and Diego has taken over as new TF Chair.
- Diego requested for volunteers for Secretary’s position. Aniruddha Narawane volunteered to contribute with this TF.
- The scope of the TF was read again for all attendees
- Chair presented the update on documentation gathered so far supporting the activity of this TF and made reference to the conference call set up in Sept 2017 as discussed in previous meeting. Chair also mentioned that with the internal survey and data relative to PF values some limits could be established however the IR data was insufficient and misleading.
- Diego requested attendees to share the PF test data for factory and field test with an intention to analyze it and possibly move forward towards the goal of TF. Ajith Varghese expressed that there should not be any concern about sharing the data. Chair also mentioned that if anyone requires NDA to be signed it is possible to do it. Poorvi Patel suggested that DGA group may have some feedback regarding the data base they used
- Charles Sweester asked about type of data to be collected if it should be new transformers or in service transformers and Diego clarified that TF is looking for new transformers factory test and before commissioning field test data.
- Poorvi Patel asked about the PF values to be shared and it was advised to collect the data for CH, CL and CHL.
- Diego also mentioned that there will be at least two meetings scheduled before the Spring 2018 meeting
- Following 11 attendees volunteered to share the data. Diego also mentioned that a standard excel sheet will be sent to the volunteers to populate it with the data. The data sheet was agreed during the conference call in September

Jaber Shalabi	Akash Joshi
Jermaine Clonts	Nitesh Patel
Fernando Miguel Leal Ramirez	Don Dorris
James Antweiler	Toby Johnson
Cihangir Sen	Jorge Cruz
Alan Peterson	

- Diego presented the plots for IR values for over 500 test results on different KVA/MVA transformers.
- There was open discussion on these values.
 - Dan Sawyer mentioned the temperature dependency of the data and the corrected data may or may not be accurate. He also questioned about the level of confidence about the IR data collected so far relative to wide variation of values.
 - There was discussion regarding the variables associated with these values and validity of the data based on these variables. e.g. Frequency, temperature, time, accuracy of instrumentation and type of measurement. Baitun Yang mentioned about different data measurements techniques.
 - Aniruddha Narawane mentioned that all questions are very valid and relevant but they will be more appropriately addressed once some data analysis is done and presented to the group
 - Nitesh Patel asked if the data to be provided was to be corrected to 20°C or not and it was mentioned to provide the raw data without temperature correction.
- Diego mentioned that there is a request from subcommittee to recommend the instrument accuracy requirements for PF under C57.12.90-10.10.2
 - Relevancy of $\pm 0.25\%$ accuracy was discussed with reference to the measurement value. Charles Sweester and Baitun Yang mentioned that it may require more clarification
- New Topic
 - Question was asked regarding the possible difference between factory test value and field test value before commissioning and how the TF plans to address this
 - Scale of measurement for instruments and data format to be standardized
 - Correlation between the PF and type of core construction
- Diego mentioned that: the data format will not be an issue since TF will be collecting the data in EXCEL format. Also scale of measurement will be based on the test. Core type can be a factor which affects the PF values and it should be included in data collection.
- No more topics
- Motion to adjourn by Rob Ghosh Seconded by Aniruddha Narawane
- Adjournment at 9.10 am

B.4 Liaison Reports

Liaison Report to Dielectric Tests Subcommittee of IEEE Transformers Committee Submitted by Jeff Britton (HVTT Subcommittee Chair)

November 1st, 2017

Louisville, KY

The High-Voltage Testing Techniques (HVTT) Subcommittee of the IEEE Power System Instrumentation and Measurements Committee met in Clearwater Beach, Florida on October 5th, 2017, in conjunction with the Fall 2017 IEEE PES Surge Protective Devices Committee. There were a total of:

13 Onsite Attendees – Comprised of 5 Members and 8 Guests

14 Web Meeting Attendees – Comprised of 5 Members and 9 Guests

HVTT Subcommittee Membership was 14 persons at the time of the meeting, so quorum was achieved. Martin Greschner of HIGHVOLT, Gavita Mugala of Siemens, and Daniel Schweickart of the US Air Force were announced as new members of the Subcommittee.

Working Group Updates: HVTT presently has 2 active working groups, 1 Task Force and 1 Entity Ballot Sponsorship Project active with IEEE SA.

WG P1122 “IEEE Standard for the Digital Recorders for Measurements in High-Voltage and High-Current Impulse Tests” Chaired by Jeff Britton (Phenix Technologies), with Secretary Tom Melle (Highvolt).

This WG met on October 5th, 2017 and continued to review and discuss the performance requirements for digital recorders as stated in IEEE 1122-1998, and to harmonize these technical requirements as much as possible with the present draft for the revision of IEC Standard 61083-1, which is presently in the CDV stage.

During the meeting, the WG voted to add a new “Type Test” classification to the test hierarchy presently defined for in the standard for approving digital recorders. Based on general improvements in the quality and technology of digital recorders since IEEE 1122 was last revised in 1998, the WG agreed that certain tests previously required to be performed on every digital recorder manufactured may now be performed once, with the results to be documented by the manufacturer.

After the HVTT meetings in Florida, the maintenance team responsible for the revision of IEC 61083-1 met in Toronto in November. Although the IEC draft was already advance to the CDV stage, significant changes were proposed to the overall allowed amplitude uncertainty. These proposals will have to reviewed in the IEEE WG, as there may be some problems and conflicts generated by these changes in both the IEC and IEEE documents.

WG P510 “Guide for Electrical Safety in High-Voltage Testing”

Chaired by Jeff Hildreth (Bonneville Power Administration) with Secretary Johannes Rickmann (Phenix Technologies)

This WG met on October 5th, 2017 and continued discussions on the re-writing of the old (withdrawn) IEEE 510 Safety Guide. The chairman gave a presentation on the contents of European Safety Standard EN 50191 “The Erection and Operation of Electrical Test Installations”, with discussion on how this material might be applied in various HV Testing scenarios.

Frank Boehme of HIGHVOLT gave a presentation regarding the application of the principals of “Safety Integrity Level”, as defined in the IEC machinery safety standard 62061, into the control circuitry of high voltage test equipment.

The chair asked for volunteers to contribute to the individual sections of the guide.

The TF to develop a Scope and Purpose statement for a general IEEE PD guide met for the first time on October 5th, 2017, chaired by Nigel McQuin of McQuin Power Consulting.

Presentations on the topic of PD Measurements were given by Nigel McQuin and by Detlev Gross of Power Diagnostix. Afterwards, the following objectives were agreed upon by the TF members:

- 1) The IEEE Guide should be generic in nature, and shall avoid any conflicts with existing apparatus standards in terms of specific test procedures or acceptance levels
- 2) The IEEE Guide will not attempt to duplicate or supplant IEC 60270, but shall serve as a practical, supplemental guide on proper PD measurement technique
- 3) Measurement sensitivity and background noise level will be addressed
- 4) Some discussion will be included on the effects of the distributed nature of internal HV equipment design, and the impact this has on measuring sensitivity (e.g. distributed versus lumped circuit models)
- 5) The TF hopes to include some information on general PD patterns that may result from common physical defects in insulation, including the effects of voltage and time

The TF chair put out a call for additional topics of interest, with responses to be returned by the end of November. Anyone who would like to offer a topic may contact Jeff Britton, Jim McBride or Detlev Gross.

The PSIM Committee (parent committee of HVTT) is participating as a PES Technical Committee sponsor of an Entity Ballot PAR submitted by State Grip Corporation of China, titled “Guide for Field Measurement of Fast-Front and Very Fast-Front Overvoltages in Electric Power Systems”. The WG is composed mainly of Chinese member companies (entities), with the first WG meeting scheduled to take place in Chengdu, China, on Nov. 13th and 14th, 2017. PSIM has requested through IEEE SA that the meeting be conducted in the English language, and that a Web meeting be offered so that representatives of the PSIM Committee may observe and participate.

The next round of HVTT Subcommittee meetings are scheduled to take place in January of 2018, at the PES Joint Technical Committee Meeting in Jacksonville, Florida.

Anyone interested in participating in the work of HVTT should contact Arthur Molden, Jim McBride or Jeff Britton.

B.5 Discussions**B.6 Old Business**

PAR request for Guide for Field Measurements and Pattern recognition of Partial Discharges in Oil-immersed Power Transformers

Chair provided an update on SGCC request for a new guide for field measurements and Pattern recognition of Partial Discharges in oil-immersed Power Transformers, PAR request for which was received by IEEE SA before F16 meeting. A presentation to support this request was presented during subcommittee meeting (F16) in Vancouver. During the S17 ADCOM meeting PAR request was reviewed and the request was not approved due to significant overlap with existing standards. Further to this, before the F17 meeting, there was additional discussion (Teleconference) between IEEE SA and Transformer committee and it was agreed that if SGCC would like to pursue this further, it will be best to have it included in future revision of Field guide C57.152 provided SGCC is willing to participate.

Chair informed the subcommittee that Malia Zaman, IEEE SA liaison had informed during F17 ADCOM meeting on Sunday that informed that SGCC has withdrawn the PAR. With this, now this topic is closed.

B.7 New Business

Validity period of C57.113 Recommended practices for Partial Discharge Test is expiring in 2020 and a subcommittee motion for approval to start a WG at the next meeting was made by Alexander Kraetge and seconded by John Foschia. Motion was passed unanimously. PAR for revision of standard is submitted for IEEE SA approval. WG will have its first meeting during S18, and will be chaired by Naderian Ali. John Foschia will be the secretary.

Motion was put on the floor by Bill Griesacker to form a TF to develop PAR for creating a new guide on Low Frequency Dielectric Testing. Motion was seconded by Dan Sauer. None opposed. The motion was unanimously approved.

Don Ayers brought a motion to define PD Testing requirement for on Class 1 transformers. Motion was seconded by Thang Hochanh. Discussion followed many utilities stated they already have requirement in their own specification. Motion was modified to include this as a new item for further discussion and lay ground work in low frequency test TF. Amended to this effect was proposed by Dan Sauer which was accepted by Don Ayers and seconded by Detlev Gross. Motion was passed unanimously.

Thang Hochanh brought to subcommittee's attention that, Impulse analysis software may not be evaluating Beta' and K-factor accurately for many waveforms like Low voltage winding with high

oscillations and chop wave. Thang is requesting feedback from users, who are willing to share their issues and would like issue to be taken up by IEC groups is requested to send information directly to Thang.

B.8 Adjournment

Meeting adjourned 12.15 PM. Motion to adjourn made by Dan Sauer and Marcos Ferreira

Minutes respectfully submitted by:

Poorvi Patel

Secretary DTSC.