9.11 Performance Characteristics Subcommittee – Stephen Antosz, Chairman; Ed teNyenhuis, Vice-Chair; Craig Stiegemeier, Secretary

9.11.1 Introduction / Attendance

The Performance Characteristics Subcommittee (PCS) met on Wednesday, October 27, 2010 with 49 members and 68 guests in attendance. 12 of those guests requested membership. Prior to this meeting, the total membership of PCS was 89 members; therefore with 49 present, we did have a 50% quorum.

9.11.2 Approval of Meeting Minutes

The minutes of the last meeting in Houston, TX were approved as written.

9.11.3 Chairman's Remarks

9.11.3.1 Administrative Subcommittee Notes

a) Upcoming IEEE – PES Meetings
- PES General Meeting: July 24-26, 2011, Detroit, Michigan.
- PES General Meeting: July 2012, San Diego, California.
- Next Transformer Committee meeting date and location is as follows:
  - Spring 2011, April 10-14, – San Diego, CA; Catamaran Hotel at Mission Bay; hosted by San Diego Gas & Electric. Nice Wednesday evening dinner social event on the USS Midway, a retired aircraft carrier.
  - Fall 2011, October 30-Novemeber 3, Boston, MA; Renaissance Boston Waterfront Hotel; hosted by Charles Sweetser and Omicron USA

b) PES General Meeting Paper Presentations:
- There has been a problem with authors not showing up for a scheduled paper presentation. In the future, if the presenter is absent, then the paper will not be published nor posted on the website.

c) Update on status of revisions of C57.12.00 and C57.12.90:
- Both new Standards have been published as 2010 versions, containing some changes as submitted by the WG's within this subcommittee.
- We will continue working on future revisions, as they pertain to this subcommittee.

9.11.4 Working Group (WG) and Task Force (TF) Reports

9.11.4.1 WG on Loss Evaluation Guide C57.120 – Don Duckett, Chair; Alan Traut, Vice-Chair

PAR Status: PAR Approved. PAR expiration Date: 12/31/2014.
Current Draft Being Worked On: None

Attendance: 57 Total. 14 of 22 Members present. 5 Requesting membership. 38 Guests.

The meeting was called to order at 11:00am on Tuesday October 26, 2010.

Attendance of membership was taken and a quorum was established. The minutes of the Spring 2010 Houston meeting were approved as submitted. A request was made for

disclosure of any patents that may be related to the work of the WG, and there were no responses to the request for disclosure.

Chair reported that the PAR for revision of C57.120 has been approved by NESCOM on March 25, 2010 and expires 12/31/2014.

The following participants volunteered to assist in the development of C57.120/D1 prior to the Spring 2011 San Diego meeting: David Harris, Jerry Allen, Steve Shull, Jose Izquierdo, Jerry Murphy, Gael Kennedy, C.R. Bell, Wally Binder. Al Traut will forward the old C57.120 and C57.12.33 documents along with supporting documents to the volunteers listed above. Dave Harris suggested we include the RUS loss evaluation document in the draft preparation.

There was no other new business.

9.11.4.2 PCS WG on "Test Code C57.12.90" – Mark Perkins, Chairman; Kirk Robbins, Secretary

1. Introduction of members and guests
2. Patents
3. Approval of minutes of the Houston Meeting (not official, as only 29% of the WG membership was in attendance.)
    - Motion and second, minutes approved unanimously, but since we did not have a quorum the approval will need to take place at a future WG meeting.
4. Old Business
    - New C57.12.90-2010 was published on October 15, 2010, including the new resistance measurement section and updates on zero sequence test.
    - Revision of Section 6 & 7. Polarity and Phase Relation Tests and Ratio tests – We need to discuss the latest proposal before sending for survey again. It was sent for survey in April 2009, with some (limited) comments received. Most replies seemed favorable. From the limited replies there is concern that the document may not have been reviewed in depth by the membership.
        - Ratio and polarity test observations:
            - Ratio and Polarity test is a single phase test done on either single or multiphase transformers
            - Historically, separate tests for ratio and polarity were needed due to test equipment limitations
            - Today, equipment is available to test both simultaneously
            - Some users still due separate ratio and polarity tests
            - The term "Ratio Test" now often means both ratio and polarity
            - Ratio test is actually a voltage ratio test, not a turns ratio test
                - Effective ratio
                - "Effective" Turns ratio
                - "Nameplate" Voltage ratio
            - The ratio test allows field test results to be compared to factory baseline
        - A significant discussion took place on the information (actual turns or required voltage) that's provided on the nameplate. Mark requested that the Working Group responsible for C57.12.00 provide some guidance on this question of terminology.
        - Mark noted the following purposed of Ratio and Polarity tests:
            - Make sure transformer voltage ratio matches nameplate voltage ratio

        - Verify that the transformer is connected properly according to the nameplate vector drawing
        - Used to check for shorted turns or open turns
        - Often first test done after a transformer incident to check for a failure
        - Verify the tap changer position after changing taps
    - The types of transformers tested include:
        - Transformers with all winding terminals brought out to bushings that can be tested directly on the terminals
        - Transformers with some terminals not brought ought that must be tested from the other terminals while shorting out one or more legs of the core
        - Transformers with interconnected windings that can be tested with the available terminals by some special procedure.
        - Transformers with buried or interconnected windings that can only be tested during the assembly process when internal connections are accessible
    - WG agreed to look at Ratio and Polarity sections at Fall 2007 mtg. in Minneapolis
        - 9 pages of C57.12.90 for sections 6 and 7
        - Hadn't been reviewed/revised for decades
        - Modern methods were missing
    - WG discussed and prepared a draft of suggested changes in 2008/2009
    - Surveyed first draft of Changes one year ago
    - 20 people returned survey
    - 5 people submitted comments
    - The comments have been included
    - As we move ahead, questions include:
        - What should we do now?
        - Is there something missing?
        - Should Sections 6 and 7 be combined?
        - A suggestion was made to including them before section 5 (a sequence reorder, not necessarily a combination)
            - Do we need to expand purposes and background information?
            - Do we need to reduce the sections?
            - Should we just keep going with the proposed changes?
        - Steve Antosz suggested that we not go looking for new work, but simply send the suggested changes (voltage ratio vs. turns ratio) to the group so that we can get a feel for how everyone views these. C57.12.80 refers to what we've been calling "Voltage Ratio" as the "True Ratio."
- The most recent revision removed Figures 2 & 3 – showing subtractive and additive polarity. A comment was received that they had value from a learning/academic perspective. No one suggested brining those figures back into the standard.
- It was suggested that we remove the first clause in 6.2.2 and in 6.3.2.1 that refers to a "ratio of 30 to 1 or less."
- Wye-zigzag connection was added to Figure 5. Mark noted that these figures are not all inclusive, but representative of various configurations.
- A comment was received that we remove section 6.3.3. No dissention was noted during the meeting
- Changes will be made in section 7 in line with better defining effective turns.
- A review of possible new wording was conducted for Transformers with Inaccessible Neutrals (or inaccessible terminals).

- A suggestion was made that Figures 2 & 3 be brought back in to aid users. It was noted that those figures were redundant with information already contained in the standard. This question will also include this question – retain, move to annex, or drop altogether.
- The question of testing buried tertiary windings was reviewed. The group agreed that this question should be included on the survey to be sent to the working group.

5. New Business
   - A proposal was made to provide a section on ratio measurement using a capacitance bridge. However, no details were offered at the meeting. This process may be considered if details are received in the future.
6. Motion for and unanimous agreement for adjournment of this unofficial meeting took place at 9:45am.

9.11.4.3 PCS WG on "Guide for the Application and Interpretation of Frequency Response Analysis for Oil Immersed Transformers", PC57.149 — Chairman; Charles Sweetser

There were 63 people in attendance, and a quorum was established. The first order of business was to show the slides regarding patents, assurances and inappropriate behavior. The minutes from the Houston, TX 2010 meeting were not approved. This will be addressed at the next meeting.

Working Group Chair Update

Draft 8 was circulated within the subcommittee on August 10, 2010. Comments were collected and are ready for discussion, and are summarized as follows:

1. It was recommended that DETC be spelled out in the instance of first time use; De-Energized Tap Changer.
2. In Clause 3.2 FRA baseline measurement, lines 26 & 27, it was recommend adding a few clarifying words to the second and third items in the list: Insert "Prior to" in front of "Short-circuit testing"; Insert "Required by" in front of "Customer Specification"
3. In Clause 4.5 Test Leads, line 23. The reference to 'Clause 4.5' for self-checking lead integrity needs to be removed, since this reference is already in Clause 4.5.
4. Clause 4.7 LTC and DETC positions, line 10. The phrase "the previous tap position" should be restated more clearly. 'Previous' depends on the direction the tap changer has moved, and is not clear. Matt Kennedy will provide new text for clarification.
5. Clause 4 did not include information regarding 'shipping configuration'. The information already exists in the transportation guide and will be provided by Matt Kennedy and Greg Anderson.
6. The Clause 1.2 "Purpose" states that FRA is ideally a comparative type test and references the term "previous measurement." However, FRA has value where no comparison is available.

   The new Purpose reads as follows and will be submitted for change during the ballot request process:

   The FRA measurement is a comparative type test, where a transfer function measurement from one winding circuit arrangement is compared to a previous measurement, a similar transformer, or between phases of the same winding arrangement. This trial use guide will aid the user in the process to produce uniform and repeatable results that can be successfully used and archived for analysis purposes for decades into the future.

7. The use of "Short Circuit Test" will be changed to Short Circuit Measurement in the document.
8. In Clause 3.4, there is nothing about the frequency interval at which the FRA tests are made, and a sufficiently small interval should be made in order to capture all series and parallel resonances. A statement will be added that requires a minimum sample rate of 200 measurements per decade either spaced linearly or logarithmically.
9. In all tables in Section 4, with respect to the Transfer Admittance (TA) measurements, there needs to be a better description of which terminals are grounded. A footnote will be added to better clarify which terminals should be grounded.
10. In Table 5 and Table 6 in Section 4, there is reference to "Tertiary". Since these tables refer to three-winding transformers, Tertiary will be replaced by Low Voltage (Y).

A vote, under quorum conditions, was performed approving the ballot process. The ballot process will be initiated once the changes are made.

9.11.4.4 PCS WG on "General Requirements C57.12.00" – Steve Snyder, Chairman; Enrique Betancourt, Secretary

The Working Group met at 3:15 PM on Monday, October 25, 2010 with **31** members and **63** guests present. After review and clean up of the Working Group roster, the current Working Group membership stands at **57** members ; therefore we did have a quorum at the meeting. The following six (6) guests requested membership, that will become effective only after confirmation of attendance to two (2) consecutive meetings:

Peter Balma	Peter M. Balma Engr. Consulting
Willie Mangum	Niagara Transformer Corp.
Richard von Gemmingen	DOMINION
Sanjib Som	Virginia Transformer Corp.
Jose Izquierdo	Siemens Guanajuato, Mexico
Javier Arteaga	ABB South Boston

Three (3) new members will become active for the next meeting:

Jose Gamboa	Siemens
Krishnamurthy Vijayan	CG Power System Canada
Steve Schroeder	ABB

Following introductions, the minutes of the March 8, 2010 Houston were approved. Working Group members were then asked if anyone was aware of any applicable patent activity that might impact our work. No patent issues were disclosed by anyone.

The chairman provided an update on the status of C57.12.00. After several recirculations, the document was finally approved and officially published on Sept 10, 2010.

The meeting began with **Old Business**, WG item 82 :

WG Item 82, Clause 7.1.4.4 Stabilizing Windings
Addresses an issue raised in an earlier ballot of standard C57.12.00 which requested :

(a) Recommendations for guidelines to determine MVA rating of buried tertiary windings,
(b) To define the conditions under which this MVA is applicable, and
(c) Determine the tests or calculations necessary to prove the tertiary MVA rating.

The meeting of the Task Force on Stabilizing Windings took place on Monday October 25, with 19 of 30 members present. Chairman Enrique Betancourt presented a summary of the progress accomplished by the group. The text proposed for a new clause within C57.12.00, that would address the thermal rating of stabilizing windings, was circulated among the members of the Performance Characteristics and Insulation Life Subcommittees. The comments from 23 respondents were reviewed and extensively discussed. Main items still under discussion include a validation of a proposed 20% as a minimum-sufficient rating for stabilizing windings of autotransformers, and the appropriate temperature limits for transient loading of stabilizing windings.

Active participation of Mr. V. Sankar helped to reinforce the need for a thermal rating for stabilizing windings, independent of their short circuit strength. An additional contribution from Mr. K.Viyajian helped clarify the meaning of the minimum rating proposed by default for stabilizing windings, in the case where the users' specs leave this item open.

The task force chairman will prepare a new version of the proposed text for inclusion in C57.12.00 that first will be reviewed among the task force membership, and then sent for another survey within the PC SC and IL SC.

The Task Force received a report on the status of their application to begin working on the development of a "Guide for The Application of Tertiary and Stabilizing Windings". A Title, Scope and Purpose for the document have to be agreed within the members of the group before the task force can begin this work – hopefully before the next meeting in San Diego.

Before closing the meeting, Xose-Lopez from the University of Vigo (Spain) gave a short presentation on his paper related to hot spot calculations for Y-Y transformers w/o stabilizing windings.

WG Item 87, Table 18 Short-circuit apparent power of the system
This item is based on a comment (negative ballot from 2006) that the system short circuit current levels listed in Table 18 are unrealistically high, leading to designs that may be uneconomical. The suggestion was to limit these assumed fault current levels to 63 kA and lower.

Pierre Riffon explained the background of his comment, and the chairman opened the floor for discussion. Loren Waagenar explained that the table was derived in the 70's, projecting high future system fault levels. The chairman explained that other committees within IEEE were addressed with the question, with very few responses. IEC standards were reviewed and lower values found for system fault currents. After considerable discussion, a motion was made and seconded, to form a new task force with the objective to review this issue. Bruce Forsyth volunteered to lead the new task force.

Under **New Business**, the discussion began with WG item 91 :

WG Item 91, Discussion on Core Loss Measurement Before/After Impulse Test
This Item was a referral from PCS Chairman Stephen Antosz.

Requested Change : Discuss the merits of specifying the sequence in which the core loss measurement is performed relative to the impulse test. Presently the standards do not specify, but it has been suggested that the impulse test may influence the core loss measurement.

It was explained that some users currently specify test sequences that deviate from the sequence in C57.12.90, and that in some cases it is specified that the core loss guarantees be met by testing immediately after dielectric tests. After a series of comments on historical data and references to other standard bodies, a motion for "do nothing, based on no technical sense perceived" was approved by 27 in favor vs. 3 opposed. Item 91 is considered closed.

WG Item 92, Add to Nameplate, Oil Volumes from 25C and 65C to Low Alarm

Change Requested by : Malcolm Thaden – C57.12.00 - 2009 Ballot Comment

Requested Change : There is an interest in knowing how much oil would be spilled before the liquid level gauge would reach the low level and alarm. Add liquid level volumes from 25°C and 65°C levels to low oil liquid gauge level.

After initial discussions, the Working Group felt that a better understanding of Mr. Thaden's concern was necessary before trying to resolve his comment. As Mr. Thaden was not present at the meeting, the chairman of the WG will get in contact with him to gather more information about his comment, before the next meeting.

The chairman then asked if there was any new business, with none received from the attendees.

9.2.4.4.1 Task Force on Tertiary/Stabilizing Windings Enrique Betancourt

The Working Group met at 8:00 AM on Monday, October 25, 2010 with **19** members and **83** guests present. The current Working Group membership stands at **30** members; therefore we did have a quorum at the meeting. Six (6) guests requested membership that, by current rules, will become effective after attendance to two (2) consecutive meetings:

Ajit Varghese	Waukesha Electric
Bogdan Ionescu	Pennsylvania Transformer
Doug McCullough	Maxima / Hyundai
Javier Arteaga	ABB South Boston
Marshal Stewart	EFACEC
Robert F.Tillman	Southern Co. Services

According to IEEE TC attendance rules for membership, after this meeting two (2) new members become now active for the next meeting:

Bogdan Ionescu	Pennsylvania Transformer
Jennifer Yu	Pacific Gas & Electric

Following introductions, the minutes of the March 9, 2010 Houston meeting were approved. Working Group members were then asked if anyone was aware of any applicable patent activity that might impact our work; no patent issues were disclosed by anyone.

Old Business
Our work addresses an issue raised in an earlier ballot of C57.12.00 that requested:

(a) Recommendations for guidelines to determine MVA rating of buried tertiary windings ("Stabilizing Windings", as defined in C57.12.80)
(b) To define the conditions under which this MVA is applicable, and
(c) Determine tests or calculations necessary to prove the (buried) tertiary MVA rating.

The chairman presented a summary of the progress accomplished by the group in previous discussions. It was agreed that the short circuit capability of Stabilizing Windings is properly addressed within C57.12.00 (Clause 7.1.4.4.), and that a new paragraph was required to accomplish our TF objective.

The text proposed by this Group for a new Clause 5.11.1.2 within C57.12.00, to address the thermal rating of stabilizing windings, was circulated among the members of PC SC and IL SC in August of this year.

Text submitted for comments:

5.11.1.2 Stabilizing Windings
Stabilizing windings shall be designed to withstand the thermal duty of the circulating current resulting from temporary load and or voltage unbalance on the main windings, as specified by the user. The main windings' unbalanced load currents and or supply voltages should be specified in magnitude, angle, and duration, by the user, to allow verification of compliance with maximum allowable temperatures according to Section 5 of the present standard.

In the event no continuous thermal duty for the stabilizing winding can be established from the user's specification, the manufacturer shall design the stabilizing winding considering the circulating current resulting from a full single phase load in the largest main secondary winding (for more than one secondary winding), and infinite bus supply on the primary winding. This is taken to be 33.3% of the transformer rating. For autotransformers, see Note 1 below.

The manufacturer shall verify transient and continuous loading calculations for stabilizing windings temperatures in order to demonstrate adequacy to the requirements established in the foregoing clauses. Initial conditions for those calculations will be considered as the transformer or autotransformer operating at its maximum continuous rating, before switching to the single phase loading conditions specified. The manufacturer is to provide the user calculated values of hotspot and average temperatures for the stabilizing winding to demonstrate that they comply with maximum allowable temperatures.

Note 1: For the particular case of Autotransformers, manufacturers have been using different criteria for dimensioning of the stabilizing windings: for example, "33% (1/3) of the highest calculated base kVA of the series or common winding (base currents for autotransformers defined by Clause 7.3.3)", or as another example, "33% of the transformation capacity of the autotransformer". Here the approach is different: the magnitud of the circulating current has to be determined from the autotransformer's impedance network, as proposed by the manufacturer.

End of submitted text –

The comments from 23 respondents were reviewed and discussed during the session. There were eleven (11) "Approval", eleven (11) "Approval with comments", and one (1) "Not Approved" responses. Main concerns were overdimensioning of SWs, and SW specific reduced capacity requirements for Autotransformers.

Active participation of Mr.V. Sankar contributed to resolve the recurrent question of the need for a thermal rating for Stabilizing Windings, independent of their short circuit strength. New material provided by Mr. K.Vijayan was introduced, describing approximate rating for SWs, as calculated by the methodology proposed in the new clause. According to Mr. Vijaian's calculations, 20% of the equivalent transformer rating seems adequate for a wide range of sizes of Autotransformers and Transformers. The material is yet to be further deployed and distributed for discussion among the TF Members.

The chairman will prepare a new version of the proposed text for inclusion in C57.12.00, to be reviewed among the TF membership, and, after that, a recirculation of the text will be carried out within the PC SC and IL SC.

The comments received form the survey that were identified to fall within the scope of a future Application Guide for Tertiary and Stabilizing Windings were segregated for future work of the Group.

The TF got report on the status of its application for working on the development of a New Guide for Application of Tertiary and Stabilizing Windings. A Title, Scope and Purpose for the document have to be agreed within the members of the group before the next meeting in San Diego.

Main items still under discussion are: validation of a proposed 20% as a minimum-sufficient rating for SWs of autotransformers, and the temperature limits for transient loading of SWs.

The next item in the Agenda was a short presentation from Xose-Lopez from the University of Vigo (Spain) on his paper related to hot spot calculations for Y-Y transformers w/o stabilizing windings.

New Business
The chairman asked for any New Business, with no input from the attendees.

The meeting was adjourned at 9:15 AM.

9.11.4.5 WG on "IEEE Standard Requirements, Terminology, and Test Procedures for Neutral Grounding Devices", PC57.32 – Steve Schappell, Chairman; Peter Balma, Vice-Chair

The Neutral Grounding Devices working group was called to order at 9:32 AM on October 26, 2010. There were 19 attendees: 9 members and 7 guests, with 3 requesting membership. Copies of the previous minutes and Draft 9 of the standard were distributed.

1. IEEE patent policy was reviewed and the group was asked if there were any disclosures. There were none.

2. It was determined that a quorum of was present.

3. The minutes from the Houston, Texas meeting on March 9, 2010 were approved.

4. The PAR for the working group is valid until the end of 2011. The input received from working group members was reviewed and acknowledged, and copyright permission to utilize IEC standard material on ground fault neutralizers.

5. The working group then proceeded to discuss Draft 9 of the document.
   - Clauses 4 and 5 combined into service conditions, it was suggested to rename Clause 4.2.1 to "External insulation."
   - There was a discussion of Tables 9 and 10 and of their origin and use. Grounding transformer suppliers indicated they still used the Tables. Sheldon Kennedy indicated he had been researching the values, and believes they come from several papers written in the 1950's. It was also suggested that Westinghouse T&D book might contain some additional information.
   - An extensive discussion of a 4 second rated device as outlined in Table 4 and several other clauses then followed. The discussion considered user requests, typical applications, and industry experience as far as the types of devices requested. A motion was made and seconded to remove the 4 second rating from the Table 4, after discussion, a vote was taken and the motion was rejected.
   - The discussion continued on rated times and considered adding a separate column to Table 4 to cover resistors. Moreover, the impacts of Table 4 on transformer and reactor design were also discussed. In addition, there were some discussion of system design and breaker and relaying considerations. There was a motion and a second to maintain the 4 second value in Table 4 and to add a new row in the Table for less than 4 second ratings. A vote was taken and the motion rejected. In additional discussion, Mike Sharp offered for the group's consideration a table of typical grounding reactors. The table illustrated the various time requirements that had been requested by users. After further discussion, another motion and second was made to revise Table 4 to indicate a rated time of 10 seconds or less and was approve by vote on same.
   - A discussion of Table 1, insulating material, determined it needs to be reviewed relative to all neutral grounding devices, and perhaps should consider oil-filled devices.
   - Clause 13.3 Temperature coefficient of resistance was reviewed with the help of an example. The example demonstrated the impact of the change of resistance and current as a result of the large temperature change in neutral grounding resistors during normal operation. The group needs to continue its work in this area and determine how to best present this material in this standard.
   - It was indicated that the group had agreed on a 40°C maximum ambient temperature, but that the document still needed to be updated to reflect this.
   - Other general updates and revisions to Draft 9 were also reviewed.

6. A suggestion was made to look at the title of document and consider its impact or clarity relative to grounding transformers, or as alternative to provide additional background to neutral grounding devices in the beginning of the document.

7. The meeting adjourned at 10:52 am.

9.11.4.6 TF on "Semi–Conductor Rectifier Transformers", C57.18.10 – Sheldon Kennedy, Chairman

The Working Group met on Tuesday, October 26, 2010 at 3:15 PM with 7 members and 7 guests present. Sheldon Kennedy chaired the meeting. We did not have a quorum.

The IEEE disclosure statement was discussed. There were no patents pertaining to this standards work for which any members had awareness.

The minutes of the March 9, 2010 meeting in Lombard, Illinois were read but could not be approved due to the lack of a quorum.

This Task Force is to work on a few special items while we still have the group together.

The chair made a proposal for a clause on electrostatic ground shields. After much discussion, Dhiru Patel and Subhas Sarkar had volunteered to offer some revisions to this proposal at the last meeting in Houston and submit them before the Toronto meeting. This was not received. Dhiru Patel offered that he would have his comments in a week or two. Don Ayers offered some comments that will be included, as well.

Phase shifted secondary windings with multi-pulse secondary windings such as 18 pulse, 24 pulse, 36 pulse, 48 pulse and 54 pulse are becoming a great part of the motor drive transformer applications, as well as higher current rectifier transformers. There is no discussion about these in the present C57.18.10 and this will need some work. We began to discuss how we would incorporate these circuits into C57.18.10 since this is all relatively new work since the document was originally published in 1998. Numerating additional rectifier and transformer circuits was discussed. At our meeting in Lombard, Dhiru Patel informed us that there were patents on a lot of the methods of phase shifting windings by the drive and rectifier companies. Not wishing to have a problem with patents, the Task Force decided to just propose general discussions of phase shifting windings and not give any of the exact phase shifts that are being used in industry. This seemed the best way to accomplish this. The Chair submitted a proposal of a general discussion of the topic for the Task Force to consider. It was well received but needs some additional comments by members. Members will give comments to the chair and a more complete proposal will be submitted by the next meeting.

There was a discussion about determining the losses in specific regions due to harmonics. IEC has tackled this subject already in an Annex and this should be done in our next revision, as well. An example of the response of the windings to the 5^{th}, 7^{th}, 11^{th}, and 13^{th} harmonic, for instance, is much different than the fundamental current when we examine the leakage fields and loss densities with finite element methods.

There was a discussion about the standards being written in the Vehicular Transportation Society of IEEE. A traction rectifier transformer standard, rectifier standard and many C37 switchgear standards are being revised by this organization with emphasis on the needs of the transit and rail industry. Concerns about duplication of standards and conflicts in the standards were raised. This standard has been withdrawn and nobody is aware of its future direction.

The chair announced that the IEC Converter Transformers for Industrial Applications IEC 61378-1 standard is under revision again. The chair discussed some of the highlights of their latest draft. We will ask IEEE to request a copy of their work for harmonization with

our document. To date, I have not been able to get approval to share the information. After the meeting the chair again discussed this with IEEE and may be able to get this before the next meeting.

There were no further comments. Since we didn't have a quorum, we couldn't make a motion to adjourn, so we all just faded away at 4:00 PM.

9.11.4.7 WG on "Switching Transients Induced by Transformer / Breaker Interaction", PC57.142 – Robert Degeneff, Chairman; Bill Griesacker, Secretary

1. There was no meeting of the working group this session.

2. The guide was recirculated a fourth time between April 1 and April 10, 2010. There were 154 eligible voters. 136 voted with 121 voting affirmative, 4 negative, and 11 abstentions. 15 comments were received.

3. Draft 8.2 of the guide was recirculated a fifth time between June 14 and June 24, 2010. There were 154 eligible voters. 138 voted with 125 voting affirmative, 2 negative, and 11 abstentions. 21 comments were received.

4. Draft 8.3 of the guide was recirculated a sixth time between October 12 and October 22, 2010. There were 154 eligible voters. 143 voted with 129 voting affirmative, 3 negative, and 11 abstentions. 3 comments were received. This was a 98% affirmative vote. Two of the comments were editorial and the third was of a general nature that can not be addressed in this ballot cycle.

5. The guide will be submitted to RevCom for it December meeting.

9.11.5 Old Unfinished Business

None

9.11.6 New Business

None