Annex F Instrument Transformers Subcommittee

Chair: Ross McTaggart
Vice Chair: Thomas Sizemore

F.1 Introductions

The attendees introduced themselves and reported affiliations.

F.2 Quorum

23 of 38 members were present - quorum attained.

41 guests were also in attendance and ten individuals expressed an interest in joining the ITSC.

F.3 Agenda

An agenda was displayed for this meeting. A motion to approve the agenda was made by Vladimir Khalin and this was seconded by Pierre Riffon. No objections to the agenda were raised by the floor.
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F.4 Approval of minutes – Louisville KY and Pittsburgh, PA meetings

Both were approved at this meeting. The Louisville minutes had not been approved earlier due to a quorum not being present at the Pittsburgh meeting. Motion to approve by Vladimir Khalin and this was seconded by Pierre Riffon with no objections from the floor.

F.5 Status of C57.13 Standards

Ross briefly presented the status of the various standards handled by the ITSC:

Status of C57.13 Standards

Standard	Title	Status
C57.13	Standard Requirements for Instrument Transformers	Published 2016 rev due 12/31/2025
C57.13.2	Standard Conformance Test Procedures for Instrument Transformers	PAR exp 12/31/2021
C57.13.5	Standard of Performance and Test Requirements for Instrument Transformers of a Nominal System Voltage of 115 kV and Above	PAR exp 12/31/2020
C57.13.6	Standard for High Accuracy Instrument Transformers	reaffirmed 2010 rev due 12/31/2020
C57.13.7	Standard for Instrument Transformers with max output of 250 mA	Submitted to RevCom PAR expires 12/31/2018
C57.13.8	Standard Requirements for Station Service Voltage Transformers	PAR extended Exp 12/31/2019
C57.13.9	Standard for Power-line Carrier Coupling Capacitors and Coupling Capacitor Voltage Transformers	PAR exp 12/31/2021

F.6 Working Group Reports

F.6.1 WG on Station Service Voltage Transformers - D Wallace

The meeting of the C57.13.8 Working Group met at 8:00 AM as convened by Chair David Wallace. Roster sheets were circulated for attendees to sign in.

A total of 52 people were in attendance with 22 members and 30 guests. 22 out of 32 members were present, therefore quorum was met. 6 guest requested membership.

The agenda was presented. Pierre Riffon made a motion to accept the agenda and Vladimir Khalin seconded the motion. The agenda was accepted with no objection.

The Patent Claims Statement was presented to the workgroup with no claims being identified.

The minutes from the Pittsburg meeting were presented. Igor Ziger made a motion to accept the minutes and Patrick Rock seconded the motion. The minutes were accepted by unanimous agreement.

Pierre Riffon gave a presentation on how temperature rise measurements and short circuit testing are outlined in C57.12.90 and how they should be referenced to C57.13.8. It was decided to send out a survey addressing both the Temperature rise and the Short circuit.

Temperature rise Survey will address adding the 4 methods of temperature rise measurements to the C57.13.8 and referencing the procedures in C57.12.90. The 4 methods are: Actual Loading, Back to Back, Short Circuit and Using active components.

Short Circuit Survey will address combining relative components from C57.13 and C57.12.90 to create a short circuit clause which will consist of 3 shots. 2 asymmetrical and 1 symmetrical.

<u>In old business:</u>

The results of the survey on Clause 7.3 was reviewed. Part 1 had a response ratio of 56% yes and 44% no. Part 2 had a response ratio of 67% – yes, 22% - no and 11% - abstain. It was agreed to redo the survey to keep reference to C57.12.90 and include a statement “2% and less change in impedance requires repeat of routine test, greater than 2% up to 7.5% change in impedance requires internal inspection of unit.”

David will send the survey out to the WG.

Ross McTaggart and Frank Neder will write a test procedure for temperature rise testing using a short circuit method. Comparative test results will be presented in the next meeting by way of justification.

In New Business:

In clause 1.4, Steve Snyder agreed to develop text to elaborate more in the clause.

In Clause 2 It was agreed review the normative references and update to include only those standards needed. This would be performed at the end of the draft..

In Clause 3.1.9 it was agreed to add “or largest horizontal dimension” to the end of the sentence.

In Table 4 it was agreed to add Carbon Dioxide

Due to the amount of work left on the standard, it was decided to check into holding an offsite meeting or conference meeting before the Spring meeting. David will send out a survey to determine what will be the best option and date to hold the meeting.

The meeting was adjourned at 9:15 am.

The next meeting will be at the Spring Transformers Committee meeting in Anaheim, Ca March 24 – 28, 2019.

F.6.2 WG PD in Bushings & PTs/CTs PC57.160 - Thang Hochanh

This working group did not meet as the Guide is now out for balloting

F.6.4 Working Group on Revision of C57.13.5 "Standard of Performance and Test Requirements for Instrument Transformers of a Nominal System Voltage of 115 kV and Above.

The WG met on October 16, 2018, from 9:30 am to 10:45 am. Twenty-two (22) members and twenty-one (21) guests attended the meeting. Six (6) guests requested membership. The meeting was chaired by Pierre Riffon, WG chair. Mr. David Wallace was the vice-chair.

This was the sixth WG meeting.

Attendance has been recorded in the AM system.

Required quorum was met, presence of at least 18 members was required.

The agenda has been reviewed and was approved unanimously. The motion of approving the agenda was made by Deepak Kumaria and was seconded by Thomas Sizemore.

Minutes of the Pittsburgh meeting minutes have been approved by all members present. The motion of approving the Pittsburgh meeting minutes has been made by Deepak Kumaria and was seconded by Arnaud Martig.

Call for patents has been made and no essential patent claims have been reported.

The first item of business, was related to the review and the discussion on the comments received on D1.6 Twenty-five comments have been received. The main decisions made on the comments received were:

- A paragraph regarding the need of density switches having at least two alarm levels for gas-insulated instrument transformers will be added;
- A paragraph regarding pressure test on gas-filled enclosures will be added. References to CSA and CENELEC standards will be made;
- The definition regarding rated arc proof current will be move after the definitions related to arc proof performance;
- The IEC R10 series will be given as preferred values for rated arc proof current;
- Internal arc classes I and II will be kept since these classes are also used in other IEEE and IEC documents;
- RIV test levels will be kept as 1,1 x $U_m / \sqrt{3}$ (same level as required by IEC);
- The BIL value of 950 kV for 230 kV system voltage will be changed to 900 kV. The chopped-wave and power frequency levels will be adapted accordingly;
- Partial discharge test levels shown in Table 1 and Table 4 will be clarified and probably put in a single Table.

The Chair will issue a D1.7 based on the decisions taken during the meeting. Comments to D1.7 will be required before the next meeting in order to be discussed at the next meeting in Anaheim, CA on March 26. 2019. The Chair is hoping that this will be the last round of comments before issuing the Draft for Sponsor Ballot.

A PAR extension will be required because it does not seem to have enough time to complete the document before the end of the PAR which is December 31, 2020.

The meeting ran out of time and the meeting adjourned at 10:45 am on October 16, 2018. The adjournment motion was made by Deepak Kumaria and was seconded by Thomas Sizemore.

The next meeting is planned to be held in Anaheim, California, USA, on March 26, 2019.

F.6.5 C57.13.9 Working Group for PLC Capacitors and CCVT's – Zoltan Roman

Zoltan Roman started the meeting as Chair with Mike Craven as Secretary. Introductions were made.

This is the fourth meeting as a Working Group. There were 39 attendees including 16 members and 8 requests for membership. We had a quorum of 61.5%. Membership review will be made after the meeting. The Agenda was approved.
The patent notice was made and there were no patent claims by attendees.
The Minutes from both the Fall 2017 meeting in Louisville and the Spring 2018 meeting in Pittsburgh were approved with no corrections by unanimous consent. The Agenda was reviewed.
Zoltan started Old Business by reviewing the results of surveys sent out since the last meeting:
Survey question 1 was whether to revise insulation levels in Table 5 to values from C57.13 Standard Requirements. Neither the approving not dissenting survey votes had a definitive reason for their recommendations. Zoltan is requesting a basis for the voltages and will go to the Substations Committee for an independent opinion.
Survey question 2 was whether to accept new Table 7 proposed PD extinction voltages. The survey results were split (6) NO to (6) YES with counter proposals and yielded much discussion about the basis of the numbers. After a poll of members it was decided to go with the proposed values.
Survey question 3 was whether the electro-magnetic unit of a CCVT could be disconnected during testing. After much discussion it was decided yes, but to be tested at a 5% higher than the proportional test voltage.
The last Old Business item was to add RIV Table 9, a Draft 3 revision. A poll had 8 accepting new table and PD levels and (2) to delete the requirement of RIV test below 115 kV.
New Business was to continue with Draft 4 edits. For section 7.1.1 Ross will provide the original document to add Table 10 burdens and impedances. For section 7.1.2 the transient response burdens will have the same VA values as the accuracy class burdens and the thermal burden ratings should be at 85% to allow margin for saturation or gap operation. A guest has offered to send comments and questions for further discussion of the thermal ratings.

Date and place of the next meeting will be the Transformers Committee Meeting in Anaheim California, Spring 2019. Barrett moved to adjourn at 12:15.

F.6.6 C57.13.2 Working Group for Conformance Test Procedures – Thomas Sizemore

Attendees: 43 people attended, 19 members were present and 14 individuals requested membership which will be reviewed.
Rosters: A roster was circulated for members and guests.
Essential Patent Claims: Text was displayed and the Chair inquired as to if anyone knew of essential patent claims. None were brought up.
Minutes and Agenda: Minutes from the previous meeting and the agenda were approved. The first motion was by David Wallace and second by Igor Ziger.
Review of the current version of the standard:
Based on the meeting that took place in Jacksonville the comments were reviewed.

- Proposed text was presented for Section 7.5 Mechanical Rating Test. This text was approved as it was written and these changes will be in the coming draft.
- Proposed text was presented for Section 8 which was approved as it was written and it will be in the coming draft.

- Section 9, David Wallace commented we should verify, which the, certified agencies are as per the IEEE (who are authorized to certify the equipment). Marek Kornowski commented that we should not list any specify company name in the standard. Once text changes are worked on between Igor and Thomas as survey will be sent out for comment.
- Marek Kornowski commented we should insert table 4 (list the routine test) in section 4.7 from the main standard.
- Survey to be sent in regards to the temperature rise test(whether to include it in this standard or just to do a reference to the main standard)

Motion to adjourn: A motion was put forth by David Wallace and second by Marek Kornowski
Next Meeting: This WG will meet to continue work at the spring 2019 meeting in Anaheim, California.
Next version of draft: A new draft is being prepared to update based on comments. It will be issue between meetings with a request for comments. Results of the surveys referenced above will also be presented to the working group.

F.7 New Business

F7.1 Task Force on Instrument Transformer Accuracy Requirements

As a result of the survey results and since there was no objection from the floor, discussions and actions to initiate a Task Force to review accuracy requirements have begun. Igor Ziger will be Chair of this TF. The TF will meet at the S19 Meeting

F7.2 Report from PSIM

Thomas Sizemore led a short discussion on work being done under PSIM covering a sensor accuracy test methods guide being developed.

F7.3 Corrigendum

Ross McTaggart indicated that a corrigendum is needed for C57.13. Two specific areas are known to need correction. First in section 11.3.1.7 the text calls for comparison of the first full wave and the last full wave. Other standards reference comparison of the first reduced full wave to the final full wave. Second a typographical error is present in section 4.1.1 with the use of the words usual and unusual. Finally it was indicated that the definition of RCF has a discrepancy versus text provided in the metering handbook. Steve Shull will investigate historical information on this topic. Pierre Riffon suggested a 1943 paper regarding the parallelogram be reviewed. Upon review it will be determined if C57.13 requires clarification on RCF definition. Other errors may be included in this corrigendum if provided by the membership.

F7.4 C57.13.1 Field Testing of Relaying Current Transformers

Diego Robalino mentioned that an updated version of C57.13.1 which is covered by PSRC was issued without comments from our sub-committee. He requested that the ITSC be informed of future changes.

F7.4 Cigre WG A3.42: Failure analysis of recent AIS instrument transformer incidents

Zoltan Roman reported that a new effort has been taken up within Cigre regarding instrument transformer failures. This group will study failures and potential mitigation methods in a future paper.

F.8 ITSC Adjournment

The meeting concluded after a motion to adjourn by Vladimir Khalin and seconding of this motion by David Wallace.

The next meeting is planned to be held in Anaheim, California, USA, on March 27, 2019.