

Annex F Instrument Transformers Subcommittee

Chair: Ross McTaggart

F.1 Introductions

The attendees introduced themselves and reported affiliations.

F.2 Quorum

18 of 30 members were present - quorum attained

Also 36 guests attended

F.3 Approval of minutes – Atlanta, GA meeting

Motion by David Wallace & seconded by Pierre Riffon

F.4 Review of Agenda

F.5 Status of C57.13 Standards

Ross presented the status of the various standards handled by the ITSC. Pierre Riffon is the chair of the working group revising C57.13.5 currently. A PAR is to be written and work started on the revision of C57.13.2, Thomas Sizemore is to chair this working group. The milli-ampere standard C57.13.7 led by Henry Alton is currently in the balloting process. The SSVT standard C57.13.8 development effort led by David Wallace is continuing. A task force is being led by Zoltan Roman to revise the PLC Caps and CCVT standard. It is expected this will be a working group by the New Orleans meeting.

F.6 Working Group Reports

F.6.1 Working Group on Current Transformers with mA range (WG C57.13.7) - Chair: Henry Alton, Vice-Chair: Adnan Rashid

This WG did not meet in Vancouver. The Standard is in the balloting process

F.6.2 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 33 people were in attendance with 18 members and 15 guests. 18 out of 26 members were present, therefore quorum was met. One guest requested membership.

The agenda was presented and accepted with no discussion.

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

The minutes were presented and approved with no discussion.

In new business, Ross McTaggart made a motion to pursue a dual logo with CSA for C57.13.8. The motion was seconded by Barrett Wimberly. The motion passed with no objections. There was a discussion on the requirements to obtain the dual logo and if it was possible to obtain a triple logo with IEC. Various concerns were expressed during the discussion. Ross will give a presentation on the requirements for the dual logo at the Spring 2016 meeting in New Orleans, La.

In old business, the list of comments from the request for comments on C57.13.8 D3 were discussed. 26 of the 77 comments received were either accepted or rejected. Time ran out for the meeting. It was agreed to continue the discussion at the Instrument Transformer Subcommittee meeting on 10/26 if time is permitting. If the review of the comments cannot be completed on 10/26, a conference call or web meeting will be setup to finish the review.

A motion to adjourn the meeting was offered by Patrick Rock and seconded by Steve Oakes. The motion carried unanimously without discussion.

The next meeting will be at the Spring 2017 Transformers Committee meeting in New Orleans, La.

F.6.3 WG PD in Bushings & PTs/CTs PC57.160 - Thang Hochanh

Attendees: 57

Members attending: 20/34

Rosters: Circulated for members and guests.

Agenda: An agenda was presented 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: Motion approved David Wallace (1st) & Pierre Riffon (2nd)

Items discussed based upon comments received:

A total of 17 comments were received for discussion many were editorial or minor in nature. Details of the discussion points are below.

Comments accepted and which will be in the next draft:

- Introduction – An introduction will be added to the draft.
- IEEE C57.13 was not in the list of references.
- 6.3.1 Figure 3 text is to be updated for consistency of wording which references test taps.
- 6.3.2.1 Pierre Riffon proposed text for the bushing section to match the instrument transformer section regarding measured PD limits after the calibration step.
- 6.4 It was proposed to move the list of abbreviations from 6.4 up in the document to 3.2 as they are used throughout the document.
- 6.4 Shibao Zhang proposed an editorial change from ‘is’ to ‘are’ to correct grammar.
- 6.4 Shibao Zhang proposed an editorial change in paragraph 1 to change the indication of bushing tap for consistency.
- 6.5.1 Shibao Zhang proposed to add the following text to the end of the section. "Calibration circuits in Figures 10 and 11 may be slightly adjusted to reflect the testing circuits in Figures 5, 6, and 9. However, the calibration injection points should always be the outlet of the capacitance C1 of the test object, points A and B. “
- 6.6.1 Pierre Riffon indicated that a precision need to be mentioned to reflect the point that the verification of a valid calibration is performed at a level not necessarily at 50% of the partial discharge limit for DC bushings.

- Thomas Sizemore indicated that several figures need to be updated to improve consistency of line weights, etc.
- Pierre Riffon: Correction to figure 17 labeled as a balanced circuit (unbalanced circuit).
- Figure 10: For the clarity of the figure, the chair proposes a dotted line box around the capacitor and the square wave signal generator.
- 7.2.1 Vladimir Khalin indicated that no explicit instructions were provided for the testing of line to line VTs.
- The annex 'PD Measuring Circuits' covers many of the same topics as the guide. It was decided to remove it due to duplication of definitions and explanations.
- Thomas Sizemore propose an introduction to be added to the annex related to PD patterns.

The follow comments were discussed but not accepted.

- 6.5.1 Jitendra Mamtora indicated a potential error in the calibrator circuits used in the guide.
- An additional pattern taken from an online monitoring system was discussed. The PD pattern cannot be positively identified being in the bushing installed on a transformer.

Additional items discussed:

The wording of the PAR was discussed. It currently does not cover DC bushings which are in the draft document. The working group agreed to pursue a change in the PAR to incorporate DC bushings in the guide. Tom Provost indicated that he is willing to assist the Chair in this process.

Motion to adjourn: A motion was presented by David Wallace and was seconded by Detlev Gross.

Spring meeting 2017: The chair plans to wrap-up the draft for the New Orleans meeting and submit the Draft for approval by the WG.

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 25, 2016, from 9:30 am to 10:45 pm. Thirteen (13) members and forty-three (43) guests attended the meeting. Eight (8) guests requested membership. The meeting was chaired by Pierre Riffon, chair of the WG. Mr. David Wallace was the vice-chair.

This was the second WG meeting.

Attendance has been recorded in the AM system.

Required quorum was met, presence of at least 7 members was required.

Revision 2 of agenda has been reviewed and a motion to approve the agenda has been made by Mr. T. Sizemore and seconded by Mr. S. Oakes. The revision 2 of the agenda was approved by all members present.

Minutes of Atlanta meeting were approved unanimously. The motion was made by Igor Ziger and seconded by Thomas Sizemore.

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

As the first item of business, the Chair proposed a new relaying accuracy designation when an anti-remanence gap is added within magnetic circuits. The proposal was to add a "R" suffix after the C class designation as it is done in IEC 61869-2. After discussion, a motion made by Zoltan Roman and seconded by Igor Ziger to survey if this rating is really needed. The motion was accepted by 12 members, one abstained. The chair will initiate a survey in this respect within the Instrument Transformers Subcommittee membership prior to the next meeting. The Chair will also ask if this class is better to be added, for the time being, to C57.13 (amendment) or to C57.13.5.

Draft 1.2 of the revision of C57.13.5 was circulated by Email to the members and guests prior to the meeting on September 11, 2016.

Changes proposed in D1.2 have been reviewed one by one up from clauses 10.9.2 to A.2, Several changes were mainly editorial in nature such as reference clause numbers and date of referenced standards.

Among the proposed major technical changes, the following items have been discussed:

- Only external visual inspection will be required after short-time current test;
- The choice of fuse wire dimension and material for arc initiation during internal arc test will be let to manufacturer. The only criteria is that the fuse wire shall melt within 30 electrical degrees after current initiation;
- Alternative gases will be allowed and suggested for the internal arc test. The Chair will make a proposal prior to the next meeting;
- Additional details have been added regarding the documentation to be supplied to the test laboratory for test sample identification;
- The temperature rise test procedure for CTs having dielectric losses greater than 20% of the RI^2 losses has been discussed but we were running of time. Zoltan Roman will make a proposal for the next meeting in New Orleans, LA.

Clauses A.2 and beyond will be reviewed during the next meeting in New Orleans.

The meeting adjourned at 10:45 am on October 25, 2016. The adjournment motion was made by Mr. T. Sizemore and was seconded by Mr. R. Ogajanov. The motion was approved unanimously.

The next meeting is planned to be held in New Orleans, LA on April 4, 2017.

F.6.5 C57.13.9 Task Force for PLC Capacitors and CCVT's – Zoltan Roman

The Task Force held its second meeting at 11:00 AM.

A total of 31 people were in attendance, down from 41 at the previous meeting. 14 of the 21 members were present. 1 additional person requested membership.

After introductions the minutes of the previous meeting and the agenda for this meeting were presented and approved.

The draft PAR has been reviewed. It will be submitted as-is with the exception of the date of the draft submittal for the ballot. It has been reiterated that one of the objectives is to harmonize the new standard with the existing C57.13, C57.13.5 IEEE standards, as well with the current IEC and CSA CCVT standards.

The existing CCVT standard, ANSI C93.1, has been reviewed and the chair pointed out the need for restructuring. Rather than modifying this document the preference is to start from scratch using the IEEE template. There were no objections to this approach.

The chair presented a table with the proposed structure and a schedule for development of the new standard. The plan is to complete the standard in 7 meetings and some teleconferences in between. There were no objections.

The TF reviewed and compared the voltage ratings and dielectric test requirements between C93.1, C57.13, C57.13.5, CSA and IEC. It was noted that the test levels in C93.1 were in some cases much higher than in the IEEE or IEC requirements and it was suggested that they should be the same as for other instrument transformers. This was questioned by S. Misur, stating that there may have been a good reason for this so we should be careful. However, nobody in attendance knew the reasons for the higher levels. D. Sharma offered to provide a switchgear standard as another reference.

The chair offered to prepare a table summarizing the dielectric test requirements for the next meeting and make initial proposals for levels to include in the draft, which will be discussed and voted on in the next meeting.

The meeting was adjourned shortly before 12:15 PM.

The next meeting will be at the Spring 2017 Transformers Committee meeting in New Orleans, LA, between April 2 and 6, 2017

F.7 Special Presentation

Zoltan Roman presented the results of several CTs measured and plotted in both the current parallelogram and the proposed square for accuracy classes.

Eddy So gave a presentation regarding the applicability of TCF/RCF in current applications. Some questions were raised concerning how utilities and other groups such as Measurement Canada would adapt to the proposed changes.

F.8 New Business:

It was determined by unanimous vote that a new task force would be initiated to investigate the proposed changes to the accuracy classes. This work should be in the New Orleans meeting. At this time a chair has not been determined.

F.9 ITSC Adjournment

Motion to adjourn by David Wallace and seconded by Marek Kornowski

The next meeting will be at the Spring 2017 Transformers Committee meeting in New Orleans, LA