

Annex F Instrument Transformers Subcommittee

**November 4, 2015
Memphis, TN**

Chair Ross McTaggart

F.1 Introductions

The attendees introduced themselves and reported affiliations.

F.2 Quorum

14 of 24 members were present - quorum attained

Also 25 guests attended

F.3 Approval of minutes – San Antonio, Tx meeting

Motion by David Wallace & seconded by Henry Alton

F.4 Review of Agenda

F.5 Status of C57.13 Standards

The status of the various standards handled by the ITSC was reviewed. Three items in particular were noted. First C57.13.5 needs to start the revision process. Pierre Riffon has agreed to co-chair this effort. David Wallace indicated he is willing to act as the co-chair as well. C57.13.6 will be allowed to expire or be withdrawn as it is now covered by the version of C57.13 now under review by RevCom. A survey will be sent out regarding the C57.13.2. Some members questioned how heavily the standard is used. If it is used regularly then the process to revise it should start within a year or so.

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

Henry Alton provided an update on the efforts by this working group. The working group is ready to move this standard to the balloting process. A vote was needed at the sub-committee level confirming the process was followed. Subsequently a vote was taken resulting in a unanimous decision to proceed with balloting this standard.

F.6.2 TF on Station Service Voltage Transformers - D Wallace

The meeting of this 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 15 out of 27 members present. A quorum was met.

The agenda for the meeting was presented to the WG. A motion was made and seconded to approve the agenda. The motion was approved with no objections.

The minutes from the San Antonio, Tx meeting were reviewed. A motion and second were made for approval. The minutes were approved.

The results of the six surveys that were generated from the San Antonio meeting were presented to the WG. Five of the surveys were accepted by the majority and agreed to be inserted into D2 of the standard. The 6th survey dealing with special test was rejected from inclusion. Pierre Riffon agreed to give a presentation on the Endurance Chop Wave test and Igor Ziger agreed to give a presentation on the Internal Arc Test. Both of these presentations will be given at the upcoming meeting in Atlanta, Ga.

With the surveys completed, a review of the comments made on draft 2 of C57.13.8 was started. 24 of the 74 comments were discussed before the meeting time had expired. At 9:15 a motion and second were made to adjourn the meeting. The motion was approved.

After a brief introduction and comment, Ross McTaggart ceding the remaining time from the C57.13 meeting to the C57.13.8 meeting. A total of 45 people were present with 20 members. A quorum was met.

During the meeting, the remaining 50 of the 74 comments were reviewed and either accepted as presented, accepted with further comment or rejected. The comments that were accepted will be inserted into the current draft of the standard. The ones that require further comment will be modified and sent out as a survey to the work group for discussion at the next meeting.

Draft 3 of the standard will be released for group review and comments.

A motion and second were made to adjourn the meeting. The meeting was adjourned at 10:45 AM.

The next meeting will be at the Spring 2016 Transformers Committee meeting in Atlanta, Ga USA.

F.6.3 Working Group for Revision of IEEE C57.13 Instrument Transformers - R. McTaggart

No meeting was held – Standard is with RevCom

F.6.4 WG PD in Bushings & PTs/CTs PC57.160 - Thang Hochanh

The meeting of this working group was led by Thang Hochanh. Roster sheets were circulated for attendees and guests to sign in. Interested individuals could also indicate an interest in joining the working group on these forms. A check for a quorum was made at the beginning of the meeting and the quorum requirements were not met with 11 members in attendance.

The minutes from the San Antonio meeting and the agenda for this meeting were presented, but due to the lack of quorum they were not submitted to the WG for acceptance.

Thang Hochanh made a request for additional partial discharge test patterns. Andre Rottenbacher and David Wallace indicated they could provide additional patterns for the instrument transformers.

As a means of guiding the discussion a series of comments by Pierre Riffon and the most recent draft (5.3) were reviewed together. Most items were relatively small items but the four specific items listed below were the main discussion points.

Item 1: Clause 4.2.2 Test circuit:

The ambient noise of $\frac{1}{2}$ the maximum partial discharge limit should only be “a desirable goal”. Nevertheless, the noise can be as high as the partial discharge limit if during the test nothing over the noise level is observed.

Discussion of this point was initiated between Thang Hochanh and Pierre Riffon. An item contributed by Detlev Gross was that the nature of the signal must be considered if the background noise is not low.

The main point of the discussion is that a test can be accepted when the stationary noise generated by the source / environment can be clearly identified from the partial discharge coming from the test object.

New text for this section is to be proposed based on this conversation.

Item 2: Clause 6.5.1 Calibration

The calibration shall be performed within 50% and 200% of the PD limit. Replace "...at 50% and 200%..." by "...within 50% and 200%..."

Pierre discussed what he meant in this comment. Both Dave Gibel and Thang Hochanh had several comments to ensure that intent of this comment was clear. Pierre Riffon emphasized that a calibration at the PD limit is the preferred level but acknowledged that in some situations this is not practical.

In résumé, the discussion cover the case were the calibrator used for the test does not have the exact pico-coulomb limit prescribed by the test requirement.

As an example, when the partial discharge limit is 25 pC and the available calibrator does not have this exact value, the test person can choose the value below or above the required partial discharge limit.

50% of 25 pC is 12.5 pC

200% of 25 pC is 50 pC

Usually commercial PD calibrators, have step values of 20 pC and 50 pC, in the above range.

The test person can choose 20 pC or 50 pC as the initial calibrated value.

Item 3: Clause 7.2.3 Perform a calibration of the test circuit

This is similar to the discussion of Clause 4.2.2 and will be handled similarly in this section.

The ambient noise of $\frac{1}{2}$ the maximum partial discharge limit should only be "a desirable goal". Nevertheless, the noise can be as high as the partial discharge limit if during the test nothing over the noise level is observed.

Item 4: Clause 7.3.1 (CT)

Often, the pre-stress level is equal to the power frequency withstand test (see IEEE C57.13.5). When performed at 50 Hz or 60 Hz the pre-stress voltage duration is maintained for a duration a 60 seconds not 7200 cycles.

The conversation on this point focused on the difference in the required frequency for CTs and PTs.

It is necessary to take in account in this clause the frequency of the test source in order to comply with the 7200 cycles and the frequency of the source. This subject is related to applied voltage to potential instrument transformers. When the frequency of power source is higher than 2 time the power frequency (i.e. 60 Hz), then the duration will be less than 60 seconds. The minimum duration is still no less than 15 seconds. The 60 seconds is the maximum duration for all cases.

Example:

Power source frequency is 180 Hz. Applied duration will be 40 seconds.

Shibao Zhang made a proposition to remove 2 paragraphs of clause 6.2, concerning the inboard end of the bushing in oil. It was accepted by the chairman.

The meeting was dismissed as the discussion on comments from Pierre Riffon was completed.

Spring meeting 2016: This WG plans to continue working at the Atlanta meeting.

F.7 Special Presentation

Eddy So created a presentation regarding the applicability of TCF/RCF in current applications. This was presented by Adnan Rashid. Limited questions were asked and the presentation will be made available to the members of the sub-committee. Pierre Riffon questioned if the power factors have really changed as indicated in the presentation noting that utilities target unity power factor. Zoltan Roman noted that if the method for determining accuracy is to change then the standard burdens need to be reviewed as well.

F.8 New Business

Ross McTaggart brought up that our sub-committee is being asked to take over a portion of the work for the CCVT C93.1. Zoltan Roman will chair the efforts of the ITSC. This will be a joint working group. A task force is to start work in the spring meeting.

F.9 ITSC Adjournment

Motion to adjourn by David Wallace and seconded by Henry Alton.