

Annex E HVDC Converter Transformers and Smoothing Reactors Subcommittee

**April 3, 2017, 3.15 pm
New Orleans, Louisiana, USA**

**Chair: Michael Sharp
Vice Chair: Les Recksiedler
Secretary: Ulf Radbrandt**

E.1 Introduction / Attendance

Introductions were made and the attendance list circulated.

There were 13 members and 12 guests present. One guest requested membership,

The total membership of the SC is 17. We needed at least a total of 9 members to be present in order to have a quorum. This was achieved.

The agenda for this meeting was approved.

E.2 Approval of the minutes of the October 24, 2016 meeting in Vancouver

The minutes from the Vancouver meeting were approved.

E.3 Brief report on the meeting of the Administrative SC

Each WG meeting must go through a patent call.

For ballot resolutions the following applies for different Disposition Status categories:

- Accepted. Comments must be adopted exactly as proposed. The Disposition Detail should be left blank. If the comment is agreed but with a very little change then the status should be Revised.
- Revised. The Disposition Status shall explain how the Proposed Change has been adopted (revised).
- Rejected. The Disposition Status must explain why.
- If there are several equal comments with the same answer, then Disposition Details cannot refer to other Disposition Details. The answer must then be copied.

Each member of the Transformers Committee is responsible to keep his/hers data (e.g. e-mail address) updated in the AM system.

Reminder that IEEE C57.129 will expire in 2018 and IEEE 1277 will expire in 2020.

E.4 Working Group Reports

E.4.1 WG IEC/IEEE 60076-57-129 – Transformers for HVDC applications

Chair: Ulf Radbrandt (IEEE) and Mats Berglund (IEC), Co-Chairs

Ulf Radbrandt made a presentation regarding the status of the work with the dual logo document. The highlights of that presentation and following discussions are as follows:

- The document was out for a recirculation ballot between March 02 and March 17 this year.
- The actual ballot status is:
The ballot has met the 75% returned ballot requirement, 89% returned.
66 eligible people in the ballot group.
52 affirmative votes
3 total negative votes with comments
1 negative vote with new comments
0 negative votes without comments
4 abstention votes: (Lack of expertise: 1, Lack of time: 2, Other: 1)
The 75% affirmation requirement is being met, 94% affirmative
- Negative vote 1, from first ballot.
Comment “please consider specifying in the Scope of the Std if it applies to transformers used with Line Current Commutated (LCC) technology or Voltage Source Converters (SVC) technology, or both.”
The comment was rejected. The reason for the rejection is that the WG consider it to be too late to change the scope. Anyway, this standard covers all HVDC transformers including VSC where applicable.
- Negative vote 2, from first ballot.
Comment “Add IEC 60099-9, IEC 60099-4 and IEC 60099-5 to the Bibliography”
This comment was accepted.
- Negative vote 3, from the recirculation ballot.
Comment “The structure of clause 2 is not in line with the requirement to have no leading text. The sub-clause 2.1 should be integrated into the whole body or sub-clauses should be added.”
It is not decided yet how we will respond to this comment. There were no comments regarding this at the first ballot and this has not been changed since the first ballot. Anyway, modifications in this direction have been done by the IEC editorial review.
- The Decisions by Standardization Management Board (SMB) of IEC has now agreed that it is ok to have alternative references (IEC or IEEE) and that the purchaser decides which to be used for the whole document. This means that the process with this document and three other dual logo standards can proceed.
- The IEC editorial review did not only cover spelling and grammar. It included some functional changes also and the most critical are listed below:
 - The dates were added to the references of IEC 60076-1 and IEC 60076-3. That means that when those standards are revised than this standard will refer to the old standards.
 - The phrase “If only one alternative is given in a certain part of the document, i.e. only IEC reference(s) or only IEEE reference(s), then that/these reference(s) is/are valid independent of the choice of normative references.” has been removed from clause 2.1 “Use of normative references”. We have single references at some locations in the document and we would miss that requirement if the document is used for the other standard. As example, partial discharge measurement refers only to IEC 60270 and was supposed to be valid also for IEEE usage.
 - A statement that “All the requirements in IEC 60076 are valid” is changed to IEC 60076-1. That is probably correct.

- A number of notes have been transferred to mandatory text. Some of them lead to functional changes of the standard. E.g. insulation coordination (which is an HVDC system study) has now become a requirement in the document.
- IEC is planning to publish the document as it is after the editorial update.
- Erin Spiewak checked the status of the FDIS and it has been launched March 31 and will be finalized May 12. Normally, an IEC document is not changed during this process but it is strange that IEEE is not asked if changes are ok when we are working with a dual logo document.
- We must get explanation from IEC about the reasons for the changes.
- We must now explain why we won't accept some of the changes. We should insist that the document be modified as soon as possible and relaunched.
- Coming work with this document:
 - IEC convener (Mats Berglund) checks within IEC about the reason for the functional changes.
 - Agree with IEC (within the joint WG) how to handle the functional changes.
 - Distribute the results within the SC and the joint WG.
 - Possible new recirculation ballot within IEEE (because of the functional changes).
 - FDIS within IEC

E.4.2 WG IEEE P1277 - Dry-Type and Oil-Immersed Smoothing Reactors and Dry-Type Converter Reactors

Chair: Klaus Pointner (klaus.pointner@ieee.org)
Vice-Chair: -
Secretary: Ulf Radbrandt (temporary)

E.4.2.1 Introductions and Call for Patents

This was the first meeting for this WG. It was conducted as part of the HVDC SC meeting.

The WG chair, Klaus Pointner, asked the members if they are aware of any essential patent claims that could affect the work by the WG but nobody expressed any knowledge of such claims.

Notification IEEE SA: Roberto Zannol (roberto.zannol@it.abb.com) affiliated to ABB, Inc. has registered an interest in PE/TR/HVConv-WG1277 HV Converter TR & Reactors - Req. & Test Code for HVDC Smoothing Reactors Working Group.

E.4.2.2 Review of the PAR, scope, purpose.

The PAR was approved by February 17, 2017

The PAR will expire December 31, 2021. That means that we have 10 meetings from now from PAR point of view but we should try to finish earlier since the standard expires in 2020.

Survey Results on PAR input

Statistics:

- Proposed text sent to 25 individuals
- 10 returns
- 7 approvals without comments
- 3 approvals with comments
- 0 disapprove
- 0 abstains

Changes in Title

The new title is “Standard General Requirements and Test Code for Dry-Type and Oil-Immersed Smoothing Reactors and for Dry-Type Converter Reactors for DC Power Transmission” where the words “and for Dry-Type Converter Reactors” are added.

Changes in Scope

The scope of this standard is “This standard only applies to smoothing reactors for dc transmission and converter reactors for dc transmission located at the converter arms”.

A discussion of the term “converter arms” followed. The decision was to explain this in the definitions.

Purpose

The purpose of this standard is to provide those in the HVDC industry, manufacturers and "end users", a document that defines and specifies the electrical, mechanical and physical requirements of dry-type and oil-immersed smoothing reactors for HVDC (high voltage direct current) applications. Furthermore the document defines and specifies electrical, mechanical and physical requirements of dry-type converter reactors used for voltage sourced HVDC converters (VSC HVDC) which are located at the converter arms and loaded with DC and AC current. Test code is also defined and specified

E.4.2.3 Review and Definition of Work Items

Input: Word File of actual version, drawings and figures (tif format)

Copy will be made available at Transformers Committee Subcommittee Website

Proposed First Work Items:

- Review of service conditions – incorporation of the converter reactors
- Review of oil (liquid) immersed Smoothing Reactor part and proposal for changes/updates (e.g. insulation liquids). Peter Heinzig volunteered to do a draft update of this part.
- Basic description of converter reactors (new). Klaus Pointner will ask for support at Trench for this.
- Review of proposed tests and test sequence (both dry-type and liquid-immersed)
- Proposal of routine-/type/special tests for converter reactors (new)

- Sound level measurement. Should align with the latest work in IEEE and/or IEC. Christoph Ploetner volunteered to do a draft update of this part.
- Review of appendices. Are they still valid or is update required? The UHVDC and VSC parts might now be incorporated into the main part of the standard.

E.4.2.4 New Business

The document is now ~100 pages. We should have the aim to make it shorter.

All WG members are encouraged to go through the document and send comments to Klaus Pointner.

Klaus Pointner will distribute the Word document for the standard. It should be named Draft 1 and be put in Track Changes mode.

We will continue with this meeting as a part of the SC meeting. The work with the converter transformer standard will hopefully soon be completed.

E.4.2.5. Adjournment

The WG meeting was adjourned and the SC chair, Mike Sharp, took over with the SC meeting.

E.5 Old Business

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E.6 New Business

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E.7 Adjournment

The meeting was adjourned at 4.14 pm.