C37.100.1 WG
Common Requirements for HV Power Switchgear Rated Above 1000 V
April 26, 2016 – Hilton Head Island, South Carolina

The Working Group for the revision of C37.100.1-2007 held its 9th meeting on April 26, 2016 on Hilton Head Island, South Carolina. Twenty-four WG members and twenty-four guests were present.

Meeting was called to order at 10:20 AM by WG Chairman, David Stone.

Oral Introductions of meeting members followed and attendance sheets were circulated.

The agenda was reviewed and approved. In like manner, the minutes of the previous meeting held in San Diego, California were approved.

All attendees were reminded of the process and access requirements to retrieve information from the IEEE document archives at the following URL:
http://grouper.ieee.org/groups/c37/100/1/private.

Username and password were shown at the meeting and may be requested by WG members from the Chairman.

WG Membership
Membership stands at 21 regular and 17 corresponding for a total of 38.

Results of the 2nd Ballot (1st recirculation ballot):
The ballot closed on January 17, 2016 (draft D4):

- 155 ballot group members
- 16 negative ballots
- Approval rate increased to 87%
- 138 comments (48 editorial)

The Chairman had given a preliminary disposition to 70% of the comments leaving 42 open for review by the WG. Chairman emphasized that all comments are subject to review by the WG members.

IEC 62271-1:

A report on the IEC MT1 activities was given by the Chairman. MT1 (formerly MT34) circulated its 3rd committee draft (IEC 62271-1/CD) for comments ending in July 2015. The results were discussed at the IEC SC17A meeting in Stockholm in December 2015. The project was approved to proceed to the CDV stage with the CDV due out in June.

Proposed Timeline for IEEE C37.100.1:
The chairman proposed a timeline for the remainder of the project as follows:

- 2nd ballot: complete
- Resolve 2nd ballot comments: April/May. 2016
- 3rd ballot June or July 2016
- Submit to RevCom: 3rd qtr. 2016

Review of 2nd ballot comments – key discussion points: Note: Unless otherwise noted the comment numbers refer to the comments received in the 2nd ballot as "r01-xxx" where "xxx" is the number given below.

- Comment 70; WG voted unanimously to approve changing clause numbering in the next edition, (ed. 2) to conform to IEEE Style manual. See Annex B.
- Comments 82 & 83 rejected: It was noted that the transformer standards also refer to an average ambient temperature over a 24 hour period.
- Comment 58 rejected. These statements ought to remain informative notes. The control of condensation is a construction issue, not a service condition.
- Comment 59 & 60 rejected. Retain pollution service condition as stated in 2.1.3 f and i). Protecting the swgr. is a construction matter.
- Comment 122 accepted; A temperature range f) for -15 C to +50 C will be added. It was pointed out that this applies to certain desert locations, e.g. California, Nevada and Arizona, USA, where solar energy installations and related switchgear equipment are being installed.
- Comment 62 rejected. Standards for buildings are outside the scope of switchgear standards.
- Comment 79: Reject Comment 79. Remove requirements for IK coding, but consider retaining the definition to accommodate the placeholder clause for IK coding.
- Comment 63 rejected. Comment is in regards to shortened duration of power-frequency withstand test. This change is not appropriate for design tests nor for this common requirements standard. It should be left to the relevant equipment standards to consider.
- Comment 56 accepted - There are conflicting comments from two different ballot members. The two significant digit values, e.g. 2.1, 2.5, will be retained and the 3 digit calculated values deleted from the table. The note will be revised with a reference to Annex I where further clarification will be given.
- Comment 64 rejected. The proposed wording restricts design options without any technical justification.
- Comment 42 rejected. The standard assumes normal application of switchgear - we do not need to explicitly exclude damage or misuse.
- Comments 45, 18 and 46 addressing new requirements for design when the equipment is installed in "publically accessible areas" – The WG and commenter agree to withdraw these comments as they will be addressed in the relevant equipment standard for reclosers, C37.60.
- Corrosion, subclause 5.21 **–** The WG agreed to remove this paragraph and replace with reference to IEC 62271-306 as is being done in IEC 62271-1 CDV draft.
- Comments #25, #126 regarding ambient thermocouple placement for temperature rise – The WG agreed to keep the IEC method as preferred but add the IEEE method as an acceptable alternative. It was pointed out that the IEC method requires a larger room in which to perform the test.
- Comments #111 & 24, preliminary tests of vacuum interrupters for lighting impulse withstand voltage testing – After considerable discussion and a technical presentation by Ian Rokser of Eaton, the WG voted unanimously to change the limit on preliminary tests from 5 to 25. The new wording proposed: "*When testing switchgear incorporating an open vacuum interrupter, for each polarity, a maximum of 25 preliminary impulse tests may be performed at up to and including the rated withstand voltage. The number and level of preliminary impulses are to be stated by the manufacturer. Breakdowns that are observed during these preliminary tests shall be disregarded for the purposes of the withstand statistics used to determine pass or fail performance of the equipment*."

- The following two comments were carried over from the 1st ballot. The commenter was present for the discussion:
    - Definition of a vacuum interrupter in clause 3; i.e. word choice “highly evacuated” or “high vacuum” - The WG decided not to change the definition and retain the phrase “highly evacuated”.
    - Preferred rated duration of short circuit, subclause 4.8 - Currently 1 s is specified as the preferred value; the comment proposed 2 s. The WG decided by vote not to change from 1 s as preferred rating. It was pointed out that the relevant equipment standards have the option to select any of the three alternate values mentioned in the document.
- A request was made regarding Table C.1— Environmental examples by site pollution severity (SPS) class. The table includes 3 of the 5 classes from the IEC 60815-1 and the request was to include all 5 classes. The chairman is concerned that the definition of the two more severe classes is too complex for the simple Table C.1. **Mr. Devki Sharma** was asked to (re) submit his proposal from the 1st draft for consideration.

Next Actions: The chairman will prepare a revised draft for the 3rd ballot that will incorporate the new numbering of clauses. The draft will be circulated to the WG for final comments and a release for the ballot will be targeted for June**.**

Next meeting: Balloting may be completed this summer, however if another meeting is necessary, it will be held during the week of October 9 – 14, 2016 in Pittsburg, Pennsylvania.

David Stone, Chairman
May 1, 2016

Annex A: Attendance: C37.100.1-2007 WG Meeting September 22 and/or 24, 2015
X = present at meeting

Role	First Name	Last Name	Company	Country	4/26/2016
Chair	David	Stone	DTS Technical Services	USA	X
Member	Chris	Ambrose	Federal Pacific	USA	X
Member	Robert	Behl	ABB	USA	X
Member	Jean-Marc	Biasse	Schneider Electric	France	X
Member	Stan	Billings	Mitsubishi Electric PP	USA	
Member	Antone	Bonner	Eaton	USA	X
Member	Russell	Boyce	Eaton	USA	X
Member	Gilbert	Carmona	Southern California Edison	USA	
Member	Steven	Chen	Eaton Corporation	USA	X
Member	Frank	DeCesaro	Eaton's Cooper Power Systems	USA	
Member	Edgar	Dullni	ABB	Germany	X
Member	Donald	Elliott	ABB	USA	X
Member	Sergio	Flores	Schneider Electric Inc. USA	USA	X
Member	Paul	Found	BC Hydro	Canada	X

Member	Edward	Jankowich	Representing ABB/T&B	USA	
Member	Hua Ying	Liu	Southern California Edison	USA	X
Member	Alex	Lizardo	ABB	USA	X
Member	Samala Santosh	Reddy	Powell Industries	USA	
Member	Charles	Ross	PGH Wong Engineering	USA	
Member	Devki	Sharma	Consultant	USA	X
Member	Matthew	Williford	Schneider Electric	USA	
Corres Member	W.J. (Bill)	Bergman	PowerNex Associates Inc.	Canada	
Corres Member	Anne	Bosma	ABB AB	Sweden	X
Corres Member	Denis	Dufournet	Retired	France	X
Corres Member	Ken	Edwards	Bonneville Power Administration	USA	
Corres Member	Kenneth	Harless	Pascor Atlantic	USA	
Corres Member	Harold	Hirz	Thomas and Betts	USA	X
Corres Member	Wangpei	Li	Eaton	USA	
Corres Member	David	McMullen	Georgia Power Company	USA	X
Corres Member	Peter	Meyer	S&C Electric Company	USA	X
Corres Member	Larry	Putman	Powell Electrical Systems Inc.	USA	
Corres Member	Carl	Reigart	Hubbell Power Systems/USCO	USA	X
Corres Member	Ian	Rokser	Eaton Corp	USA	X
Corres Member	Hugh	Ross	Ross Engineering Corporation	USA	
Corres Member	Carl	Schneider	Schneider Electric	USA	X
Corres Member	Robert	Smith	Eaton Corporation	USA	X
Corres Member	Paul	Sullivan	DuPont	USA	
Guest	Ted	Burse	Powell Industries, Inc	USA	X
Guest	Stephen	Cary	GE Energy Management	USA	X
Guest	Leslie	Falkingham	Vacuum Interrupters Limited	UK	X
Guest	Peter	Glaesman	PCORE Electric Company, Inc.	USA	X
Guest	Sahadev	Gohil	AZZ/Central Electric Mfg. Co.	Other	X
Guest	Ronald	Hartzel	Eaton Corporation	USA	X
Guest	William	Higinbotham	EA Technology LLC	USA	X
Guest	James	Houston	Southern Company Transmission	USA	X
Guest	Travis	Johnson	Xcel Energy	USA	X
Guest	Wolfgang	Jung	Siemens AG	Germany	X
Guest	Donald	Martin	G&W Electric Co.	USA	X
Guest	Gary	Martin	Entergy	USA	X
Guest	Deepak	Mazumdar	Central Electric Manufacturing Co.	USA	X
Guest	Shawn	Patterson	US Bureau of Reclamation	USA	X
Guest	Rahul	Pawar	ABB	USA	X
Guest	Laura	Reid	Hubbell Power Systems	USA	X
Guest	David	Rhein	Hubbell	USA	X

Guest	Kevin	Rogerson	Eversource	USA	X
Guest	Daniel	Sims	Eaton Corp.	USA	X
Guest	Jordan	Snider	Pacific Gas & Electric Co.	USA	X
Guest	Erin	Spiewak	IEEE	USA	X
Guest	Kyle	Stechschulte	AEP	USA	X
Guest	Jey	Thayalan	Schneider Electric	USA	X
Guest	Randy	Ward	Aluma-Form	USA	X
Guest	Robert	Warren	DNV GL - KEMA Laboratories	USA	X

Annex B – Clause Numbering

Clause No.	IEEE Style Manual 2014 - 10.3	C37.100.1-ed. 2 Common Req'ts 201x	C37.100.1-ed. 1 Common Req'ts 2007
1.0	Overview or Scope	Scope	General
1.1		not used	Scope
1.2		not used	Normative References
2.0	Normative references	Normative References	**Service Conditions**
3.0	Definitions	Definitions	Definitions
4.0	Not defined	**Service Conditions**	Ratings
5.0	Not defined	Ratings	Design & constr.
6.0	Not defined	Design & constr.	Design tests
7.0	Not defined	Design tests	Routine tests
8.0	Not defined	Routine tests	not used