

**SWITCHGEAR ASSEMBLIES SUBCOMMITTEE
MINUTES OF THE FALL 2014 MEETING**

**Renaissance Asheville Hotel, Asheville, NC USA
September 24, 2014**

The meeting was called to order by SA S/C Chair, D. Edwards, at 1:30 PM on September 24, 2014 with the introduction of the following members and guests:

Attendance

Members: 26 present, 22 absent – Quorum was met.

Guests: 25

Total: 51

Attendance is recorded at the end of the meeting minutes. Membership and attendance is recorded in the AMS system.

1. Introduction of Members and Guests

Members and guests introduced as recorded above.

2. Approval of Meeting Agenda

Fall 2014 agenda were presented and revised. Proposed change of agenda made by SA S/C Chair was accepted by unanimous consent.

3. Approval of SA Meeting Minutes

Link: <http://www.ewh.ieee.org/soc/pes/switchgear/minutes/2014-1/F14index.htm>

Minutes (link above) from the spring 2014 meeting in Orlando, FL were presented and revised.

A motion to approve was made by A. Morse, 2nd by L. Farr and was approved.

4. Working Group Status Reports

- a. **C37.100.1** – Common Requirements for High Voltage Power Switchgear Rated above 1000 V
D. Stone: No minutes provided. Copies of tables presented are attached at the end of the meeting minutes.

Note that C37.100.1 document is sponsored and supported by the Administrative Subcommittee (ADSCOM) and not a WG of the SA S/C. The presentation of this material is focused on education and coordination of this activity.

WG effort is reviewing voltage ratings and other parameters in the various Switchgear Committee documents. The goal is to have C37.100.1 to be the primary document to be searched first by all interested parties for common clauses/requirements. A copy of Table 1 - Rated insulation levels for rated maximum voltages of range I, series A and the proposed table for Common Clauses (C37.100.1) is shared with the group along with highlights of proposed changes. Changes are highlighted in Table 1 - Rated insulation levels for rated maximum voltages of range I, series A.

Group discussed why 15.5kV to be targeted versus 15.0kV. Historical knowledge of why 15.5kV and 15.0kV developed was acknowledged but not discussed. It was recognized this would be a sensitive change for all interested parties.

A common clause document is not a required acceptance to existing standards but the WG goal is to have this as broadly accepted as much as possible.

Dual logo standards currently use Table 1 as shown to the group today.

Actions for SA S/C: None

- b. **C37.20.1** – Standard for Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear
T. Burse: Minutes are provided.

A revision to the PAR to include 1000Vac ratings was approved. Quorum was met. Ballot comments were reviewed with several contentious issues successfully closed. A new draft will be generated shortly along with a re-circulation in the very near future.

Actions for SA S/C: Chair will report ballot activity.

- c. **C37.20.2** – Standard for Metal-Clad Switchgear
M. Wactor: Minutes are provided.

**SWITCHGEAR ASSEMBLIES SUBCOMMITTEE
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WG met on Monday with 17 of 25 members and 28 guests in attendance. Document went to ballot. 413 comments received and WG effort reduced to 39 comments. WG is working towards a new draft and re-circulate within 10 days. The goal of the WG is to submit to RevCom by September 29th. PAR will expire at the end of this year. PAR may have to be extended if WG cannot successfully close negative votes.

Actions for SA S/C: Chair will report ballot activity.

- d. C37.20.6** – 4.76 kV to 38 kV Rated Grounding and Testing Devices Used in Enclosures
T. Olsen: Minutes are provided.

WG met on Wednesday. Document went to ballot. 92 comments received during ballot. A “straw-man” solution was achieved and the WG approved to create a new draft and re-circulate with a goal to submit to RevCom by Sept 29th.

Actions for SA S/C: Chair will report ballot activity.

- e. C37.20.7** – Guide for Testing Medium-Voltage Metal-Enclosed Switchgear for Internal Arcing Faults
M. Wactor: Minutes are provided.

WG met on Tuesday with 21 of 30 members and 41 guests in attendance. WG reviewed the current draft and comments. PAR will expire at the end of 2015. WG goal is to ballot early next year. A new draft will be created and circulated for comments within the next 2 months.

WG received a request to include C37.20.9 GIS type switchgear in the testing guide. It was discussed that third party entities are being asked to review and qualify such products today. The current testing guide and PAR activity does not apply to such applications. WG voted to move forward with a PAR revision request to SA S/C to include C37.20.9 GIS type switchgear within the document scope.

SA S/C discussed whether to include C37.20.9 applications now or to postpone this effort to a later date. SA S/C discussed if outdoor HV circuit breakers should be included in the testing guide. The C37.20.7 WG had not received a request to include outdoor HV circuit breakers from the HVCB S/C. Guidance from IEEE Liaison to SA S/C confirmed that moving forward with a PAR revision to include C37.20.9 GIS type switchgear and not completing such work would not prevent the completion of the C37.20.7 WG effort to release a document.

Motion by M. Wactor: SA S/C to approve a PAR revision to include C37.20.9 GIS type switchgear as an annex to the C37.20.7 testing guide. 2nd: P. Barnhart. Motion approved.

Actions for SA S/C: Chair will report PAR revision.

- f. C37.20.9** – Metal Enclosed Switchgear Rated 1 kV to 52 kV Incorporating Gas Insulation Systems
E.R. Byron: Minutes are provided.

WG met this morning with 17 members and 20 guests. PAR has been approved. WG focused on comments received to date. A new draft should be issued by end of November. Several TF's formed to complete work with one TF focused on the C37.20.7 annex. Carl Schneider will become the WG Secretary.

Actions for SA S/C: No further action required.

- g. C37.20.10** – Standard for Definitions for AC (52kV and below) and DC (3,2kV and below) Switchgear Assemblies
K. Flowers: Minutes are provided.

C37.100 – Definitions for Power Switchgear is getting close to obsolescence. After the spring 2014 meeting, discussions and work were begun to combine LVSD and SA definitions into a common document. TF met Monday afternoon and reviewed title, scope and purpose to cover

**SWITCHGEAR ASSEMBLIES SUBCOMMITTEE
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both (52kV and below) AC switchgear and (3.2 kV and below) DC switchgear. The creation of a combined LVSD and SA standard definitions document does not prevent the long term goal of a broader definitions document supported by the ADSCOM S/C. Motion by T. Olsen: SA S/C to approve a PAR to create a Standard for Definitions document for both LVSD and SA S/C documents with a combined WG effort between SA and LVSD members. 2nd: T. Burse. Motion approved.

- h. C37.23** – Standard for Metal-Enclosed Bus
T. Hawkins: Minutes are provided.

WG group met on Monday and reviewed current draft/comments. WG is targeting a new draft for circulation and balloting within the next 30 to 45 days.

Actions for SA S/C: Chair will report ballot activity.

- i. C37.24** – Guide for Evaluating the Effect of Solar Radiation on Outdoor Metal-Enclosed Switchgear
L. Farr: Minutes are provided.

A first draft of the PAR was started within the WG. PAR should be completed prior to the next meeting. Motion by L. Farr: SA S/C to approve a PAR to revise the C37.24 document. 2nd: T. Hawkins. Motion approved.

Actions for SA S/C: Chair to report PAR activity.

- j. C37.81** – Seismic Qualification of Class 1E Metal-Enclosed Power Switchgear Assemblies
D. Riffe: Minutes provided.

Note that a combined WG is focused on both C37.81 and C37.82 documents.

WG Chair not present to report. SA S/C Chair participated in some of the meetings. First draft is not completed. IEEE 344 comparisons are being done to the existing documents. WG is targeting a first draft within the next month. There were not a lot of participants in this WG. SA S/C and WG Chair are looking for additional support on this effort.

Actions for SA S/C: None

- k. C37.82** – Qualifications of Switchgear Assemblies for Class 1E Applications in Nuclear Power Generating Stations
D. Riffe: Minutes Provided

Note that a combined WG is focused on both C37.81 and C37.82 documents.

WG Chair not present to report. SA S/C Chair participated in some of the meetings. First draft is not completed. IEEE 344 comparisons are being done to the existing documents. WG is targeting a first draft within the next month. There were not a lot of participants in this WG. SA S/C and WG Chair are looking for additional support on this effort.

Actions for SA S/C: None

- l. SA Common Clauses Task Force**
D. Hrnir. No meeting minutes provided.

TF is reviewing C37.100 document structure. Scope and approval is for common clauses within SA S/C documents on such topics of temperature rise, etc. TF will compile a common clause list to report to SA S/C at the next meeting.

Actions for SA S/C: None

5. Old Business

a. IEC Activities

T. Burse: Meeting minutes provide.

**SWITCHGEAR ASSEMBLIES SUBCOMMITTEE
MINUTES OF THE FALL 2014 MEETING**

**Renaissance Asheville Hotel, Asheville, NC USA
September 24, 2014**

Interpretation sheet was presented and discussed at the Tokyo meeting.

b. ASC C37 – General Update

T. Olsen: Meeting minutes provided.

Report has been provided to the secretary. Nothing has changed. Delegations need to be adjusted with participant changes. C37.50 needs to be balloted. No charge downloads from NEMA and should be available from the IEEE collections.

6. New Business

a. Senior Membership – How to... Training

D. Edwards: Copy of presentation is attached to the meeting minutes.

b. Switchgear Assemblies Committee Membership Recommendations

D. Edwards: Requirements of membership is that the individual is active, contribute, and attended 2 of the last 3 meetings. Chair will review the attendance records and is currently considering 5 members for possible inclusion.

c. Main Committee Membership Recommendations

D. Edwards: Requirements of membership is that the individual is active, contribute, and attended 4 of the last 6 meetings. In addition to these requirements, the individual must be a current member of SA S/C, PES, SA, and have the approval of the SA S/C Chair. We have five (5) members to submit to T. Olsen for consideration to main committee membership. S/A Chair will move forward with this activity.

Subsequent to S/C meeting, correction by Chair: Chair has seven (7) SA S/C members to recommend for Main Committee membership.

d. SA Document Status – Required action – review of proposed “SA Document Status” report.

D. Edwards: will be updated. WG chairs to confirm accurate statements and sessions required for next session.

e. WG Meeting Room Requests – Update “SA Document Status” report

M. Lafond: Please contact me for any changes for meeting room requirements. Meeting room requests are circulated in SA Document status.

f. ADSCOM – Items for SA Chair to discuss at ADSCOM meeting

D. Edwards: Ballot and PAR activity for C37.20.7, C37.20.10, C37.23, and C37.24 to be reported.

The timely publications of meeting minutes and all webpage updates will be brought up for discussion at ADSCOM.

S. Meiners: Curious about the activity of C37.20.9 and the inclusion of other switchgear such as C37.74. Some concern over the lack of inclusion of previous established work.

D. Edwards: SA S/C Chair requests the C37.20.9 WG Chair report any collaborative efforts between the WG and outside interested parties at next spring meeting. WG chair is willing to include additional interested parties in the effort.

g. Main Committee Items – Review items to be presented

D. Edwards: Of 14 WG's, 10 are currently active and one (1) C37.121 should be formed in Spring of 2015.

- Going to Ballot: C37.23
- Active ballots / recirculation: C37.20.1, C37.20.2, and C37.20.6
- PAR being revised: C37.20.7
- PAR's being created: C37.20.10 and C37.24
- Ongoing revision activities: C37.20.9, C37.81, and C37.82.

**SWITCHGEAR ASSEMBLIES SUBCOMMITTEE
MINUTES OF THE FALL 2014 MEETING**

**Renaissance Asheville Hotel, Asheville, NC USA
September 24, 2014**

The timely publications of meeting minutes and all webpage updates will be brought up for discussion at ADSCOM.

- h. Working Group Minutes** – To Subcommittee Secretary no later than September 26, 2014.
Email address: mike.lafond@ieee.org
- i. WG - Booklet & Website Synopsis** – To Subcommittee Secretary no later than September 26, 2014. Email address: mike.lafond@ieee.org
- j. Upcoming Meetings**
Spring 2015 (27 Apr – 30 Apr), Tradewinds, St. Pete Beach, FL USA
Fall 2015 (20 Sep – 24 Sep), Cataraman Resort Hotel, San Diego, CA USA
Spring 2016 (25 Apr – 28 Apr), Sonesta Resorts, Hilton Head Island, SC USA

7. Adjourn

Motion by SA S/C Chair: To adjourn the meeting by unanimous vote.
Motion approved.
Meeting adjourned at 2:55pm.

Reported by:

Michael P. Lafond
Switchgear Assemblies Sub-Committee Secretary
September 24, 2014

**SWITCHGEAR ASSEMBLIES SUBCOMMITTEE
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**Renaissance Asheville Hotel, Asheville, NC USA
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Attendance record and as recorded in the AMS system:

Role	First Name	Last Name	Company
Chair	Doug	Edwards	Siemens Industry, Inc.
Secretary	Michael	Lafond	General Electric
Member	Paul	Barnhart	Underwriters Laboratories
Member	Jerry	Baskin	Federal Pacific
Member	Ted	Burse	Powell Industries, Inc
Member	Eldridge	Byron	Schneider Electric
Member	Jerry	Earl	ABB, Inc.
Member	Lawrence	Farr	Eaton Electrical
Member	Michael	Flack	Southern Company Generation
Member	Keith	Flowers	Siemens Industry, Inc.
Member	Sahadev	Gohil	AZZ/Central Electric Mfg. Co.
Member	Tom	Hawkins	Siemens Industry
Member	Dan	Hrncir	Eaton
Member	Harry	Josten	Siemens Energy & Automation
Member	David	Lemmerman	PECO/Exelon
Member	Frank	Mayle	Technibus, Inc.
Member	Deepak	Mazumdar	Central Electric Manufacturing Co.
Member	Charles	Morse	Eaton Corporation
Member	Darryl	Moser	ABB
Member	T	Olsen	Siemens Industry, Inc.
Member	Miklos	Orosz	Schneider Electric
Member	Amit	Patel	GE
Member	Carl	Schneider	Schneider Electric
Member	Paul	Sullivan	DuPont
Member	Michael	Wactor	Powell Industries, Inc
Corresponding Member	James	Smith	Retired
Guest	Clint	Carne	Schneider Electric
Guest	Stephen	Cary	Eaton Corporation
Guest	Robert	Cohn	Powercon Corp.
Guest	Daniel	Delfino	General Electric
Guest	David	Dunne	Schneider Electric
Guest	Donald	Elliott	ABB
Guest	Sergio	Flores	Schneider Electric Inc. USA

**SWITCHGEAR ASSEMBLIES SUBCOMMITTEE
MINUTES OF THE FALL 2014 MEETING**

**Renaissance Asheville Hotel, Asheville, NC USA
September 24, 2014**

Role	First Name	Last Name	Company
Guest	Paul	Gingrich	AZZ / Central Electric
Guest	Douglas	Giraud	Powell Electrical Systems
Guest	Ronald	Hartzel	Eaton Corporation
Guest	Wolfgang	Jung	Siemens AG
Guest	John	McClelland	Technibus
Guest	Nigel	McQuin	McQuin Electrical Power Consulting, Inc.
Guest	Nigel	McQuin	McQuin Electrical Power Consulting, Inc.
Guest	Steven	Meiners	GE
Guest	Terry	Monahan	Schneider Electric
Guest	Andrew	Peterson	ABB
Guest	Richard	Rohr	Powell Electrical Systems
Guest	John	Shullaw	GE Energy Management - Industrial Solutions
Guest	Dean	Sigmon	Eaton Corporation
Guest	David	Stone	DTS Technical Services
Guest	Richard	Tanner	Schneider Electric
Guest	Richard	Trussler	Schneider Electric
Guest	Matthew	Williford	Schneider Electric
Guest	Terry	Woodyard	Siemens Industry Inc.

**SWITCHGEAR ASSEMBLIES SUBCOMMITTEE
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**Renaissance Asheville Hotel, Asheville, NC USA
September 24, 2014**

C37.100.1 – Common Requirements for High Voltage Power Switchgear Rated above 1000V
Presentation Material:

Table 1—Rated insulation levels for rated maximum voltages of range I, series A^a

Rated maximum voltage V(U _r) kV (rms value)	Rated power frequency withstand voltage			Rated lightning impulse withstand voltage		
	U _d kV (rms value)			U _p kV (peak value)		
	Common value ^f		Across isolating distance ^c (longitudinal insulation)	Common value ^f	Across isolating distance ^c (longitudinal insulation)	2 μs chopped wave ^b
	Dry 1 min	Wet 10 s ^e	Dry 1 min			
Col. 1	Col. 2	Col. 2a	Col. 3	Col. 4	Col. 5	Col. 6
4.76 ^d	19	—	21	60	66	—
8.25 ^d	36	—	40	95	105	—
8.25 ^e	38	30	42			—
15 ^d	36	30	40	95	105	—
15.3 ^d	50	45	55	110	121	142
15.5 ^e	50	45	55			
25.8 ^d	60	50	66	125	138	—
				150	165	194
27.0 ^d	60	50	66	125	138	—
27.0 ^e	70	60	77	150	165	—
	70	60	77	150	165	—
38 ^d	80	75	88	200	220	258
	95	80	105	200	220	—
48.3 ^d	105	95	—	250	—	322
48.3 ^e	120	100	132	250	275	—
72.5 ^d	160	140	—	350	—	452
72.5 ^e	175	145	193	350	385	—
123 ^d	260	230	—	550	—	710
123 ^e	280	230	308	550	605	—
145 ^d	310	275	—	650	—	838
145 ^e	335	275	369	650	715	—
170 ^d	365	315	—	750	—	968
170 ^e	385	315	424	750	825	—
245 ^d	425	350	—	900	—	1160
245 ^e	465	385	512	900	990	—

^a For rated maximum voltages higher than 72.5 kV up to and including 245 kV, the values in Table 2 are also applicable.

^b The 2 μs chopped wave test requirement only applies to outdoor breakers.

^c Isolation of indoor circuits is normally achieved by withdrawing the removable switching device. Refer to relevant

^d These ratings are generally applicable to switchgear equipment that is not used for isolation, e.g., high-voltage circuit

^e These ratings are generally applicable to switchgear equipment that is used for circuit isolation, e.g., high-voltage switches. Refer to relevant equipment standards.

^f Common values are discussed in 4.2.

^g Power-frequency withstand tests under wet conditions are only required for outdoor switchgear.

Proposal for Common Clauses (C37.100.1)				
Rated Maximum Voltage (kV)	Lightning Impulse Withstand kV (peak)		Power Frequency Withstand kV (rms)	
	Common Values (Note 1)	Across Isolating Distance (Note 2)	Common Values (Note 1)	Across Isolating Distance (Note 2)
4.76	60	—	19	—
8.25	95	105	36	40
	95	—	36	—
15.5	110	121	50	55
	125	138	60	66
27	150	165	70	77
	150	165	70	77
38	170	220	70	77
	200	220	95	105
48.3	250	—	120	132
	250	275	120	132
72.5	350	385	160	—
	350	385	175	193
123	550	—	260	190
	550	605	280	308
145	650	—	310	—
	650	715	335	369
170	750	—	365	—
	750	825	385	424
245	900	—	425	—
	900	990	465	512
362	1300	1300	555	555
	1300	1430	610	671
550	1800	1980	810	891
	1800	1800	860	890
800	2050	2255	940	1034
	2050	2050	960	1056

Note 1: The "common values" used in this table apply to phase-to-earth, between phases
Note 2: The withstand voltage values "across the isolating distance" apply to the switching

IEEE Senior Membership

How to?

Senior Membership Criteria

- ✓ A candidate shall be an engineer, scientist, educator, technical executive or originator in IEEE-designated fields;
- ✓ Candidates shall have been in professional practice for at least ten years;
- ✓ Candidates shall have shown significant performance over a period of at least five of those years.
- ✓ Candidates for Senior member grade must supply three references from current IEEE members holding the grade of Fellow, Senior member, or Honorary member.

Source: http://www.ieee.org/membership_services/membership/senior/senior_requirements.html

Senior Membership URL

- http://www.ieee.org/membership_services/membership/senior/index.html