

1) **Introduction of Members and Guests**

Victor Hermosillo / Carl Schuetz

Welcome, Introductions (type Name, Affiliation, Address in Chat).

2) **IEEE Patent and Copyright Policy**

Patent & copyright policy requirements were reviewed including the patent and copyright slides.

3) **Approval of Minutes of Previous Meeting**

Victor Hermosillo / Carl Schuetz

Approval of Minutes of S21, online meeting. Sent to all members and guests via e-mail.

motion for approval: Pat Di Lillo
 second : Neil Hutchins
 approved by consensus

4) **Membership**

	ROLE AS MEMBERS	ROLE AS GUESTS	ROLE AS CORRESPONDING MEMBERS	REQUIRED* FOR QUORUM COUNT	TOTAL
HVCB Committee Roster	45		TBD	≥ 50% membership at meeting (≥ 23 members)	
Attendance Recorded On-line	40	19	--	23	59

*Quorum Count includes: Active Members, Chair, Secretary and reflects excused members

Excused members (4): Denis Dufournet, Helmut Heiermeier, Anne Bosma, Joanne Hu

5) **Chairman's Report**

Victor Hermosillo / Carl Schuetz

Chairman (Victor Hermosillo): vfhermosillo@ieee.org (724) 483-7875
 Vice-Chairman (Carl Schuetz): carl.schuetz@ieee.org (262) 506-6962

- Reminder - WG chairs need to email minutes of their WG meetings to the subcommittee secretary no later than October 29th.

A moment of silence was observed for the passing of fellow colleague Xi Zhu.

- Report regarding process for project originating outside of the Switchgear Committee.

Todd Irwin

The Main Committee (MC) is presenting information regarding the need for a process to review external PARs and provide Switchgear Committee (SwgCom) adoption, or not, at each sub-committee (SC) level. The presenter reviewed the Main Committee plan to form a group that addresses external PAR requests in a timely fashion. This group is named EPAG (External Project Approval Group). A motion is scheduled to be made at the MC session to approve a sub-group formation.

Discussion was undertaken regarding frequency of external PAR requests, SwgCom is undertaking this process revision to address the expected increasing frequency of external PARs. It was explained that if SwgCom denies the PAR the PAR would not be withdrawn but may continue without SwgCom sponsorship.

6) **Reports of Working Groups**

a) **Technical Paper Reviews**

Kirk Smith

No papers recently submitted.

b) **ASC C37 Power Switchgear Report**

John Webb

First draft ready for circulation before next meeting

c) **HVCB Document Status**

Document	Title	Subcommittee	WG Chair	PAR	IEEE Status	Comments
PC37.01	Standard for High Voltage Direct Current Circuit Breakers Above 3200 Vdc	HVCB	Joanne Hu	PAR approved May 15, 2020	PAR expires Dec.31, 2024	Formerly PAR 2880
C37.04-2018	Standard for Ratings and Requirements for AC High Voltage Circuit Breakers with Rated Maximum Voltage above 1000 V	HVCB	Stephen Cary		Approved 12/05/2018	Published on May 31, 2019.
PC37.04-2018 Cor 1	Standard for Ratings and Requirements for AC High Voltage Circuit Breakers with Rated Maximum Voltage above 1000 V	HVCB	John Webb			Published on Sept. 24, 2021
C37.06.-2009 ANSI	IEEE Standard for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis - Preferred Ratings and Related Required Capabilities for Voltages Above 1000 V	HVCB		Included in PC37.04	Document expired	
C37.06.1-2018	Recommended Practice for Preferred Ratings for High-Voltage (>1000 volts) AC Circuit Breakers Designated Definite Purpose for Fast Transient Recovery Voltage Rise Times	HVCB	Sushil Shinde			Published in 2018
C37.09-2018	IEEE Standard Test Procedure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis	HVCB	Xi Zhu			Published on April 11, 2019.
PC37.09-2018 Cor 1	IEEE Standard Test Procedure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis	HVCB	Jan Weisker			Published on June 3, 2021
C37.010-2016	Application Guide for AC High-Voltage Circuit Breakers > 1000 Vac Rated on a Symmetrical Current Basis	HVCB	Andy Keels			PAR Study Group formed S21 and recommended proceeding w/PAR to revise document
C37.011-2018	IEEE Guide for the Application of Transient Recovery Voltage for AC High-Voltage Circuit Breakers	HVCB	Denis Dufournet			Published in 2019.
PC37.012-2014	IEEE Application Guide for Capacitance Current Switching for AC High-Voltage Circuit Breakers	HVCB	Roy Alexander	PAR approved 12/03/20	PAR expires 12/31/2024	
PC37.012a- Amendment	IEEE Application Guide for Capacitance Current Switching for AC High-Voltage Circuit Breakers	HVCB	Roy Alexander			Published on Aug. 7, 2020

HVCB Switchgear Subcommittee Agenda, 10/14/2021, 3:45-5:30 PM CST, on-line

P62271-37-013-2015	Standard for AC High Voltage (rated above 1000 V) Generator Circuit Breakers for Use With Generators Rated 10 MVA or More	HVCB	Mirko Palazzo	PAR approved 12/07/2016	PAR expires 10/01/2022	WG established and work continues on document.
62271-37-082-2012	Standard for High-voltage switchgear and control gear - Part 37-082: Measurement of sound pressure levels on AC HVCB	HVCB	Leslie Falkingham		Document Expires 12/31/2022	Chair to submit PAR
C37.015-2018	IEEE Guide for the Application of Shunt Reactor Switching	HVCB	Anne Bosma			Published on Mar.15, 2018
C37.016-2018	Standard for AC High Voltage Circuit Switchers Rated 15.5kV through 245kV	HVCB	Peter Meyer			Published on Feb.14, 2019
PC37.016-2018 Cor 1	Standard for AC High Voltage Circuit Switchers Rated 15.5kV through 245kV	HVCB	Neil McCord	PAR approved 02/13/2020	PAR expires 12/31/2024	Several technical errors needing revision identified.
PC37.017-2010	IEEE Standard for Bushings for High-Voltage [over 1000 V (ac)] Circuit Breakers and Gas-Insulated Switchgear	HVCB-GIS	Devki Sharma			Published on Jan. 29, 2021
PC37.10-2011	IEEE Guide for Investigation, Analysis, and Reporting of Power Circuit Breaker Failures	HVCB	Neil Hutchins	PAR approved Dec.3, 2020	PAR expires Dec.31, 2024	
C37.10.1-2018	IEEE Guide for the Selection of Monitoring for Circuit Breakers	HVCB	Dave Mitchell			Document published in 2018.
PC37.11-2014	Standard Requirements for Electrical Control for AC High-Voltage (>1000V) Circuit Breakers	HVCB	John Webb	PAR approved 02/08/2019	PAR expires 12/31/2023	
C37.12-2018	IEEE Guide for Specifications of High-Voltage Circuit Breakers (over 1000 Volts)	HVCB	John Webb			Published in 2018
C37.12.1-2018	IEEE Guide for High Voltage (>1000V) Recommended Practice for Circuit Breaker Instruction Manual Content	HVCB	Ken Edwards			Published in 2018
C37.20.6-2015	4.76 kV to 38 kV Rated Grounding and Testing Devices Used in Enclosures	ADSCOM joint HVCB/SA	T. W. Olsen			Published in 2015
C37.59-2018	Requirements for Conversion of Power Switchgear Equipment	ADSCOM joint HVCB, SA, and LVSD	Dean Sigmon			
PC37.122-2010	Standard for High Voltage Gas-Insulated Substations Rated above 52 kV	Joint SUB/SWG HVCB	Ryan Stone			Published on August 25, 2021
PC37.122.2-2011	Guide for the Application of Gas-Insulated Substations Rated 1 kV to 52 kV	Joint SUB/SWG HVCB	Eldridge Byron	PAR approved 06/03/2019	Document Expires 12/31/2021	Co-sponsored with Substation Committee.

HVCB Switchgear Subcommittee Agenda, 10/14/2021, 3:45-5:30 PM CST, on-line

PC37.122.3-2011	IEEE Guide for Sulphur Hexafluoride (SF6) Gas Handling for High-Voltage (over 1000 Vac) Equipment	Joint SUB/SWG HVCB	Billy Lao	PAR approved 09/05/2019	PAR expires 12/31/2023	PAR revised to show co-sponsored with Substation Committee.
PC37.122.10	Guide for Handling Non-Sulphur Hexafluoride (SF6) Gas Mixtures for High Voltage Equipment	Joint SUB/SWG HVCB	George Becker	PAR approved 06/03/2019	Document Expires 12/31/2023	Co-sponsored with Substation Committee.
PC57.16	IEEE Standard for Requirements, Terminology and Test Code for Dry-Type Air-Core Series Connected Reactors	Joint TF HVCB/TC	David Caverly	PAR approved 02/05/2016	Document Expires 2021	Moved to ADSCOM
PC57.142	Guide to Describe the Occurrence and Mitigation of Switching Transients Induced by Transformers, Switching Device and System Interaction	Joint TF HVCB/TC	James McBride	PAR approved 03/23/2017	Revision ongoing	Moved to ADSCOM

Note: Only those working groups highlighted and with PAR information are currently active.
 WG highlighted w/out PAR information have completed work and are not disbanded

7) Reports of AdsCom WG/TF/Study Group

C37.100.1 Common Requirements for High Voltage Power Switchgear Rated Above 1000 V John Webb

A draft of the revisions will be circulated to the working group before the S22 meeting.

TF to review Shunt Reactor (inductive load) Switching Sushil Shinde
No meeting held, no update provided.

C37.122.10 Guide for Handling Non-SF6 Gas Mixtures for HV Equipment George Becker
Leadership change, George has stepped down and Billy Lao acting chair. Outline being developed for working group work plan.

C57.16: IEEE Standard for Requirements, Terminology and Test Code David Caverly
for Dry-Type Air-Core Series Connected Reactors
Expires in December of 2021, PAR extended to 2022. The WG met in spring TRF Com meeting. Motion made and passed that SWG comments will be added to the document. TRF Com is making further revisions with the goal of a draft ready for circulation to the WG in early first quarter of 2022.

C57.142: Guide to Describe the Occurrence & Mitigation of Switching David Caverly
Transients Induced by Transformers, Switching Device, & System Interactions
Jointly sponsored by TRF Com and SWG Com.
PAR extended to 2023. No liaison TF meeting at SWG this meeting. Document passed motion to ballot and chair is sending document to MEC and start of ballot group formation in advance of F21 TRF Com meeting. An e-mail invitation will be sent to LTF members to attend F21 meeting.

Technology and Innovation Subcommittee Nenad Uzelac

Status updates for three WG presented:

- Requirement for >200% voltage in open position, white paper (M. Chhabra)
- Switchgear asset management: condition assessment and life cycle management (Andreas Nanning)
- Special applications for switchgear: HVCB Generator synchronization; effects of renewable energy: harmonics, short circuit current, X/R ratio, overvoltage; power factor testing of HVAC circuit breakers; disconnect switch transients. (S. Shinde)

8) CIGRE Reports

Report to Subcommittee Nenad Uzelac

Formed Utility Advisory Board (UAC) to add voice of customer, inviting applications.

Held CIGRE 2021 Virtual - Palais de Congres

- Finishing Technical Brochure “Interrupting and switching performance with SF6-free switching equipment” (A3.41)
- Started new working group B3/A3.60 “User guide for non-SF6 gases and gas mixtures in Substations”
- New working groups: “4th reliability T&D equipment survey” and “Lifetime Management of Medium Voltage Indoor Switchgear”
- Working on the new scope “LPIT aging protocols”

CIGRE Updates go to <https://cigre-usnc.tamu.edu/study-committees/>

9) **Old Business**

10) **New Business**

- a) Technical presentation
None
- b) Documents Approved by RevCom
Documents published:
PC37.04-2018 Cor 1
PC37.09-2018 Cor 1
PC37.122
- c) 62271-37-013 Standard for AC High Voltage (rated above 1000 V) Generator Circuit Breakers for Use With Generators Rated 10 MVA or More
Chair: **Mirko Palazzo**
Secretary: **Matt Westerdale**
Document has been approved by IEC and IEEE. IEEE is awaiting verification from IEC before being published. Chair feels the WG duties have concluded.
- d) 62271-37-082-2012 Standard for Sound Pressure Levels in Switchgear
Chair: **Leslie Falkingham**
Secretary: **Carl Schuetz**
This is a dual logo standard and has a short time before the standard expires (Dec. 2021). The intent is to submit a PAR
- e) C37.01 HVDC Circuit Breaker Standard
Chair: Steven Chen for **Joanne Hu**
Secretary: **Steven Chen**
No meeting held this session.
- f) C37.04-2018 Corrigendum 1. Standard for Ratings and Requirements for AC High Voltage Circuit Breakers with Rated Maximum Voltage above 1000 V
Request to disband WG

Chair: **John Webb**

Secretary: **Jan Weisker**

Motion made to disband the WG by John Webb

Second by: Neil Hutchins

Motion passed by consensus

- g) C37.09-2018 Corrigendum 1. IEEE Standard Test Procedure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis

Request to disband WG

Chair: **Jan Weisker**

Secretary: **John Webb**

Motion made to disband the WG by Jan Weisker

Second: John Webb

Motion passed by consensus

- h) Ad-hoc Committee of C37.04-2018 and C37.09-2018.

Chair: **Terry Woodyard**

Secretary: **John Webb**

64 attendees, two draft PARS were reviewed and submitted to HVCB secretary.

Responsible champions

Motion made to submit a PAR for C37.04 amendment submission by Terry Woodyard

Second: John Webb

Discussion: removal of generator CB standard date is recommended

Motion passed by consensus.

Motion made to submit a PAR for C37.09 amendment submission by Terry Woodyard

Second: Neil Hutchins

Discussion: an opinion was expressed that C37.06.1 should be left as a standalone document. An attendee explained that the intent of C37.06.1 was to incorporate it into C37.06 but the PAR did not make that distinction, so it was left as a standalone document. Another attendee expressed an opinion to leave the document as a standalone type and did not see the need to incorporate it into C37.04 at this time since there are a significant amount of revisions already identified.

Motion passed by consensus.

The PARs will be submitted by the Ad-hoc chair.

- i) C37.10 IEEE Guide for Investigation, Analysis, and Reporting of Power Circuit Breaker Failures

Chair: **Neil Hutchins**

Secretary: **Todd Irwin**

Two meetings were held and progress was made on document revision.

- j) C37.016-2018 Corrigendum 1. Standard for AC High Voltage Circuit Switchers Rated 15.5kV through 245kV
Chair: **Neil McCord**
Secretary: **TBD**
100% participation on ballot and 100% approval obtained. Document has been submitted for publication.
- k) C37.016 PAR SG Standard for AC High Voltage Circuit Switchers Rated 15.5kV through 245kV
Chair: Neil McCord
Secretary:
36 attendees participated in this study group (SG) session. The SG provided a PAR report for consideration. The identified need for the PAR was due to TRV values that did not match (exact match) between 37.04 and 37.016.
Motion made by Neil McCord to submit a revision PAR for C37.016.
Second:
Motion passed by consensus.
- l) C37.11 Standard Requirements for Electrical Control for AC High-Voltage (>1000V) Circuit Breakers
Chair: **John Webb**
Secretary: **Tony Riccuiti**
63 attendees, quorum achieved. Document has been significantly revised with normative requirements removed around existing clauses. An attendee provided a comment that the document intent was to provide information in visual form (by drawings) and that normative text should be in C37.04. It was realized that the normative text is needed, and that schedule coordination is required between 37.04 and 37.11 so that these operational requirements are always provided. The chair intends to extend the PAR to coordinate with 37.04 amendment revisions.
- m) C37.122 Standard for High Voltage Gas-Insulated Substations Rated above 52 kV
Chair: **Ryan Stone**
Secretary: **Jennings Graham**
SubCom has disbanded the working group.
- n) C37.122.2 IEEE Guide for the Application of Gas-Insulated Substations Rated 1 kV to 52 kV
Chair: Eldridge Byron
Secretary:
42 attendees with a quorum achieved. Ballot results due by the end of the month. Next meeting to review comments. IEC TC17 liaison needed to coordinate changes made by IEEE with IEC. John Webb asked to accept that position and John accepted.
- o) C37.122.3 IEEE Guide for Sulphur Hexafluoride (SF6) Gas Handling for High-Voltage (over 1000 Vac) Equipment

Chair: **Billy Lao**

Secretary: TBD

No meeting held and update provided in this document, section 7.).

- p) C37.010-2016 Application Guide for AC High-Voltage Circuit Breakers > 1000 Vac Rated on a Symmetrical Current Basis.

Chair: **Andy Keels**

Secretary: TBD

The meeting has been rescheduled for this Friday at 1 pm CDT. An e-mail link has been sent to the SC chair and registrar.

- q) C37.012. IEEE Application Guide for Capacitance Current Switching for AC High-Voltage Circuit Breakers

Chair: **Roy Alexander**

Secretary: **Luke Collette**

40 attendees with quorum achieved. Motion made by chair to submit the draft for ballot.

Second: Neil Hutchins

Approved by consensus and SC chair (the WG met all ready-for-ballot requirements)

Future Meetings

- a) Spring 2022: Hilton Bonnet Creek, Orlando, FL April 10th to 15th
- b) Fall 2022: Burlington, VT
- c) Spring 2023: Palm Beach, FL
- d) Fall 2023: San Diego, CA

11) **Adjourn**

Motion: Mike Crawford

Second: Patrick Di Lillo

Attendee list

Member	Mauricio	Aristizabal	Hitachi ABB Power Grids	Pittsburgh	PA
Member	George	Becker	POWER Engineers Inc.	Clover	SC
Guest	Stan	Billings			
Member	Arben	Bufi	Meiden America Switchgear, Inc.	Gray Court	SC
Guest	Sudarshan	Byreddy			
Member	Eldridge	Byron	Schneider Electric	Smyrna	TN
Member	Stephen	Cary	Eaton	Mebane	NC
Member	David	Caverly	Trench Ltd.	Scarborough	ON
Member	Steven	Chen	Eaton Corporation	MOON TOWNSHIP	PA
Guest	Andrew	Chovanec	GE Power	Charleroi	PA
Member	Lucas	Collette	Duquesne Light	Pittsburgh	PA
Member	Michael	Crawford	Mitsubishi Electric	Cranberry Twp	PA
Member	Jason	Cunningham	Southern States, LLC	Suwanee	GA
Guest	Ellis	Curry			
Member	Patrick	Di Lillo	Consolidated Edison Co. of NY, Inc.	New York	NY
Guest	Federico	Di Michele	CESI S.p.A.	Milano	Other
Member	Sergio	Flores	Schneider Electric Inc. USA	SMYRNA	TN
Member	Raymond	Frazier	Ameren	St. Louis	MO
Guest	Robert	Hanna			
Chair	Victor	Hermosillo	GE Grid Solutions	Charleroi	PA
Guest	Fang	Huang			
Guest	Bill	Hurst	GE	Charleroi	PA
Member	Neil	Hutchins	Georgia Power Company	Forest Park	GA
Member	Todd	Irwin	GE Grid Solutions	Smithville	MO
Member	Christopher	Jarnigan	Southern Company Services	Birmingham	AL
Guest	Joseph	Jasinski	ITC Holdings Corp.	Novi	MI
Member	Thomas	Keels	kEElectric Engineering	Mesa	AZ
Member	Hua Ying	Liu	Southern California Edison	Pomona	CA
Member	Albert	Livshitz	CE Power Engineered Services	Mason	OH
Guest	Alex	Lizardo Cochran			
Guest	Leo	Lopez	WIKA Instrument, LP	Lawrenceville	GA
Member	Steven	May	Southern Company	Forest Park	GA
Member	Neil	McCord	KEC Precision	Athens	GA
Guest	Kevin	McGlown			
Guest	Henning	Milnikel	Siemens	Frankfurt	Other
Member	Dave	Mitchell	Mitch and Associates	Henrico	VA
Member	Mirko	Palazzo	ABB	Zurich	Other
Member	Thomas	Pellerito	DTE Energy	Detroit	MI
Member	John	Phouminh	PEPCO HOLDINGS, INC.	WASHINGTON	DC
Guest	Matt	Polk			
Member	Anthony	Ricciuti	Eaton Corporation	Moon Township	PA

HVCB Switchgear Subcommittee Agenda, 10/14/2021, 3:45-5:30 PM CST, on-line

Member	Bobby	Rich	Dominion Energy	Richmond	VA
Member	Daniel	Schiffbauer	Toshiba International Corporation	Oliver	PA
Secretary	Carl	Schuetz	American Transmission Company (ATC)	Waukesha	WI
Member	Devki	Sharma	Entergy	Halifax	NS
Past Chair	Michael	Skidmore	AEP	Pickerington	OH
Corresponding Member	Robert	Smith	Retired	Ithaca	NY
Member	Don	Steigerwalt	Duke Energy	Charlotte	NC
Guest	Dragan	Tabakovic	Meramec Hubbell Power Systems	Clearwater	FL
Guest	Francois	Trichon	Schneider Electric	Saint martin d'uriage	Other
Guest	Jim	van de Ligt	Spark Power Corp.	Calgary	AB
Member	Jeffrey	Ward	Doble Engineering Company	Marlborough	MA
Member	John	Webb	ABB	Pawleys Island	SC
Member	Jan	Weisker	Siemens AG	Berlin	Other
Guest	Matt	Westerdale	Bureau of Reclamation	Denver	CO
Member	Terrance	Woodyard	Siemens Industry Inc.	Wendell	NC
Member	Richard	York	Mitsubishi Electric Power Products Inc.	Pittsburgh	PA
Guest	Marcus	Young	Mitsubishi Electric Power Products, Inc.	Knoxville	TN
Member	Wei	Zhang	Hitachi T&D Solutions, Inc.	Suwanee	GA