### C37.04a WG Fall Meeting, Oklahoma City, OK

10/15/2024

Chair: John Webb

Secretary: Marcus Young

Meeting Schedule: 8:00am - 9:45pm

Quorum: Quorum reached (52 of 60 voting members present)

### Minutes:

• Introductions of members and guests with affiliations including a quorum count. A quorum was present.

- Review of Patent Slides and call for essential Patent Claims: None
- Review of IEEE Copyright Policy slides: No copyright issues
- Review of meeting guidelines.
- Chair reviewed requirements to gain and maintain voting membership.
- Chair reminded attendees that the WG uses iMeetCentral as document repository. Attendees must request access from the Chair or Secretary.
  - Members: Go to "My Project" -> "My Interests" to join group to get recognition for participation in the WG.
- Approval of agenda: Motion made by Jan Weisker. 2<sup>nd</sup> by Anthony Ricciuti
  - Approved by unanimous consent.
- Review minutes from S'24 meeting.
  - o Approval of minutes: Motion made by Carl Schuetz. 2<sup>nd</sup> by Chris Jarnigan
  - Approved by unanimous consent.
- Review minutes from WG Ballot Resolution TEAMs meeting.
  - Approval of minutes: Motion made by Chris Jarnigan. 2<sup>nd</sup> by Gary Meekins
  - Approved by unanimous consent.
- Chair remarks on PAR items: Initial ballot closed on July 20th. 86% return rate (minimum is 75%) and 90% approval.
  - 101 comments to address (77 are editorial)
  - Comments to be discussed in this meeting
- Reviewed Changes to Capacitive Switching Requirements (5.8) from comment resolution meeting
  - o Comments were <u>resolved</u> as follows in the Ballot Resolution meeting on August 9, 2024.
    - Capacitive Switching for Cable or Line will remain as mandatory requirement (even if rating is CO) but must be determined by test.
- Changes to clause 9 related to current transformers
  - o Comments were resolved as follows in the Ballot Resolution meeting on August 9, 2024:
    - All Bushing CT requirements, with the exception of making the CT ratings as specified, will remain in Clause 9. The CT ratings shall now be specified as 'minimum' ratings.
- Changed to Mandatory Electrical Closing

- Discussed in Ballot Resolution TEAMs meeting on August 9, 2024. A conclusions was not reached and the discussion remained open for Fall WG meeting.
- Question from WG on whether the electrical opening by-passes the low-pressure sensor.
  - Chair indicated that C37.11 addresses this point and has requirements for low-level alarms and interlocking. C37.11 is referenced in the normative text.
  - Chair offered that in his view there is no language proposed in the amendment which by-passes any interlocks.
- The proposed change suggested in the ballot comment was to remove explicit requirements for both electrical closing and electrical opening and add the language to the following effect: "Some form of tripping the opening release of the circuit breaker in case of a fault current shall be present."
- Chair requested motion from WG to accept or reject the proposed change regarding whether electrical open/close be required or optional.
  - Motion made to reject the proposed language and keep electrical open/close mandatory: by Brad Leccia. 2<sup>nd</sup> by Robert Hannah.
  - Approved by unanimous consent.
- Comments on Creepage Table C.2
  - Proposed change in ballot comment to add an additional column for L-L voltage and alter the values in the table to match that in IEEE C37.010-2016. The proposed changes were included in the ballot comment and were shown to the WG on a slide.
  - WG member noted similar tables between C37.010 and C37.04 should be reconfigured such they are consistent/synonymous in terms of format, values, and terminology.
  - Discussion centered about format of table in current version of C37.04, the working draft of the same table in C37.100.1, and in IEC 62271-1 as compared to C37.010-2016.
    - Motion to make table C.2 USCD values consistent but leave the format as single column of voltage across the insulator: made by Jeremy Hensberger. 2<sup>nd</sup> by Chris Jarnigan.
    - Approved by unanimous consent.
- Comments on Electrical Endurance clause 5.6
  - Discussion about Annex F being referred to in 5.6.2.6. for Class E2 and is a test procedure. Should WG propose to move to C37.09 amendment 1 so late in the amendment process or should WG wait for revision?
  - WG preference: Test procedure for E2 test will remain in C37.04 for now and may be moved to C37.09 during its revision.
  - Comment to add text to the end of 5.6.2.6: "Class E1 electrical endurance capability is demonstrated by the service capability of 5.6.2.5."
- Chair reviewed the comment resolution group that was established in the ballot resolution TEAMs call back in August 2024.
  - The following volunteered for the comment resolution group in the virtual teams:
    - Terry Woodyard
    - Di Michele Frederico
    - Henning Milnikel
    - Anthony Ricciuti

- Hua Ying Liu
- Chris Jarnigan
- Steven May
- Rich York
- Andreas Bartels
- Ben Sax
- Doug Edwards
- Aaron Rexroad
- Jeff Nelson
- Chair asked WG if additional volunteers wish to join the comment resolution group. The news:
  - Eduardo Ramirez-Bettoni
  - Jesus-Manuel Avila
  - Mike Christian
- Motion to empower the comment resolution group made by Jeff Ward, with 2<sup>nd</sup> by Jan Weisker as follows:
  - Resolve remaining comments for next ballot
  - Recirculate Ballot
  - Filter Recirculation 1 Comments if Technical / General require WG review and approval.
  - Recirculate or Present to WG as needed.
- Approved by unanimous consent
- Chair indicated there will be a meeting of the comment resolution group in approximately one month.
- Meeting adjourned at 10:25 am

Reported by Marcus Young, Secretary

Attachment: WG Meeting Attendance and Affiliations

# WG C37.04a Membership & Attendance F'24.xlsx

Role	Full Name	Company Name	City	State	4/12/2022	8/24/2022	10/18/2022	4/18/2023	10/10/2023	1/30/2024	4/2/2024	8/9/2024	10/15/2024
Chair	John Webb	ABB	Pawleys Island	South Carolina	Х	Х	Χ	Х	Χ	Х	Х	Х	Х
Secretary	Marcus Young	Mitsubishi Electric	Knoxville	Tennessee	Х	Χ	Χ	Х	Х	Χ	Х	Х	Х
VM	Mauricio Aristizabal	Hitachi Energy	Pittsburgh	Pennsylvania			Χ	Χ	Χ	Χ		Χ	Χ
VM	Ganesh	Eaton						Х		Χ			
VM	Alexander Bartels	Powell Industries						Χ	Χ	Χ	Χ	Χ	Χ
VM	George Becker	Power Engineers Inc.	Clover	South Carolina			Χ	Χ	Χ		Χ	Χ	
VM	Dan Benedict	PPL							Χ	Χ	Χ		Χ
VM	Adam Brooks	Duke Energy	Cincinnati	Ohio				X	Χ	Χ		Х	X
VM	Craig Bryant	Duke Energy	Greensboro	North Carolina			Χ	Χ		Χ	Χ		
VM	Arben Bufi	Meiden America Switchgear, Inc.	Peachtree	Georgia	X	Χ	Χ	X	Χ	Χ	Χ	Χ	
VM	Stephen Cary	2 Phase Power	Ligonier	Pennsylvania	Χ	Χ		Χ	Χ			Χ	
VM	Steven Chen	Eaton Corporation	Moon Township	Pennsylvania	X	Χ	Χ	X	Х	Χ	X	Χ	_
VM	Andrew Chovanec	Power Grid Components	Chicago	Illinois	Χ	Χ	Χ	Χ	Χ	Χ	Χ		Χ
VM	Michael Christian	ABB	Elon	North Carolina	X	Χ	Χ	Χ	Χ	Χ	Χ	Χ	X
VM	Lucas Collette	Duquesne Light Co.	Beaver Falls	Pennsylvania	Χ	Χ	Χ	Χ	Χ	Χ	Χ		Χ
VM	Sergio Flores	Schneider Electric US, Inc.	Smyrna	Tennessee	X	Χ	Χ	X	Χ	Χ	Χ	Χ	X
VM	Robert Hanna	JST Power Equipment	Enterprise	Florida	Χ	Χ	Χ		Χ	Χ	Χ	Χ	Χ
VM	Jeremy Hensberger	Mitsubishi Electric	Gibsonia	Pennsylvania	X	Χ	Χ	X	Х	Χ	X		X
VM	Victor Hermosillo	General Eletric					Χ		Χ		Χ		Χ
VM	Todd Irwin	GE Grid Solutions	Smithville	Missouri	X	Χ	Χ	Χ	Х		Χ		X
VM	Christopher Jarnigan	Southern Company Services	Moody	Alabama	Х	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ
VM	Thomas Keels	kEElectric Engineering, PLLC	Mesa	Arizona	X		Χ		Χ	Χ	X		X
VM	Carl Kurinko	Hitachi Energy	North	Pennsylvania	Х		Χ		Χ	Χ	Χ	Χ	Χ
VM	Brad Leccia	Eaton	Bethel Park	Pennsylvania			Χ	X	Х	Χ	X		X
VM	Chang Hoon Lee	HYOSUNG	Changwon-Si	Seoul	Х	Χ	Χ	Χ	Χ		Χ		Χ
VM	Yong Woo Lee	KERI						X	Χ		X		X
VM	Adrian Lopez	Powell Industries	Houston	Texas			Χ			Χ	Χ		Χ
VM	Leo Lopez	WIKA Instrument Corporation	Lawrenceville	Georgia	X		Χ	X			X		X
VM	Chunming Ma	Burns and McConnell							Χ	Χ	Χ	Χ	Χ
VM	Vincent Marshall	Southern Company	Forest Park	Georgia	X		Χ	X	Х	Χ	X	Х	X
VM	Steven May	Southern Company	Forest Park	GA			Χ	Χ	Χ	Χ	Χ	Χ	Χ
VM	Neil McCord	KEC Precision LLC	Athens	Georgia	X		Χ	X	Χ	Χ	X	Х	X
VM	Gary Meekins	Southern States, LLC							Χ	Χ	Χ	Χ	Χ
VM	Fernando Ordein	Dominion Energy	Glen Allen	Virginia				Χ	X	Χ	Χ	Х	X
VM	Sumitabha Pal	Schneider Electric	Smyrna	Tennessee	Х	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ
VM	Lalit Patil	Eaton						X	X		Χ		X
VM	Craig Polchinski	Mitsubishi Electric Power	Pittsburgh	Pennsylvania	Х	Χ			_	Χ			
VM	Anthony Pounders	Meiden America Switchgear, Inc.						X	Χ			Х	
VM	Aaron Rexroad	Meiden America Switchgear, Inc.	Mauldin	South Carolina				Χ	Χ	Χ	Χ	Χ	_
VM	Anthony Ricciuti	EATON	Bethel Park	Pennsylvania	X		Χ	Χ	Χ	Χ	Χ	Х	X
VM	Alex Salinas	Doble/Vanguard	Ontario	California				Χ		Χ			
VM	Leonel Santos	Schneider Electric	Murfreesboro	Tennessee	X	Χ		X	Χ	Χ	Χ		X
VM	Ben Sax	Nashville Electric Service	Nashville	Tennessee				Χ	Χ	Χ	_	Χ	_
VM	Daniel Schiffbauer	Toshiba International Corporation	Houston	Texas	X		X	X	Х		X	X	X
VM	Carl Schuetz	ATC	Waukesha	Wisconsin	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	_
VM	Jeffrey Scott	Ameren	Bonne Terre	Missouri	X		X	X	Χ		X		X
VM	Michael Skidmore	AEP	Pickerington	Ohio	Χ	Χ	Χ	Χ			Χ		Χ
VM	Donald Steigerwalt	Duke Energy	Harrisburg	North Carolina	Х		Х	X	X	_			
VM	John Tarleton	Southern States, LLC		1					Χ	Р	Χ	Χ	_
VM	Vernon Toups	Siemens Energy Inc	Brandon	Mississippi	Х	Χ	X	X	Χ		X		X
VM	Jacob Walgenbach	Siemens	Wendell	North Carolina			Χ	Χ			Χ	_	_
VM	Jeff Ward	Retired	Billerica	Massachusetts	X	Χ	Χ	Χ	Χ	Χ	Χ	Х	X
VM	Casey Weeks	Siemens Energy, Inc.	Richland	Mississippi	Χ		Χ	Χ	Χ		_	Χ	_
VM	Jan Weisker	Siemens Energy	Berlin	Berlin	X		Χ	X		X	Χ	_	X
VM	Matt Westerdale	Bureau of Reclamation						Χ	Χ	Р		Χ	
VM	Daniel Wolfe	Mitsubishi Electric	Warrendale	Pennsylvania			Χ	Χ	Χ		Χ		X
VM	Terry Woodyard	Siemens Industry, Inc.	Wendell	North Carolina	X	Χ	Χ	Χ	Χ	Χ	Χ	X	Χ

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VM	Richard York	Mitsubishi Electric	Pittsburgh	Pennsylvania	Х		Χ	Χ	Χ		Χ	Χ	Х
VM	Mina Youssef	Eaton					Χ		Χ		Χ	Χ	Х
VM	Samuel Zaharko	Mitsubishi Electric	Warrendale	Pennsylvania	Х	Χ	Χ	Χ			Χ		Χ
NVM	Anatoly Akhunov	HICO America						Χ	Χ		X	Χ	Х
NVM	Brian Alexander	S&C Electric	atu I								Χ		
NVM	Michelle Antantis	Duguesne Light	Pittsburgh	Pennsylvania			.,				Χ		
NVM	Koustubh Ashtekar	JST POWER EQUIPMENT	Lake Mary	Florida			Χ	Χ	Х			.,	X
NVM	Jesus-Manuel Avila	ABB	7-11	Caldadaaa	V	V	V	V		X		Χ	Х
NVM	Harm Bannink	G&W Electric	Zelhem Walkertown	Gelderland	X	X	Χ	Χ		X		Χ	
NVM NVM	Paul Barnhart Andrew Beckel	UL, LLC XCEL Energy	warkertown	North Carolina		٨		Х		X	Х	۸	
NVM	Zachary Beecher	Southern States						^		^	X		Х
NVM	Robert Behl	JST Power Equipment						Χ	Х		X		^
NVM	Jonathan Benge	Oklahoma Gas & Electric						^	X		^		
NVM	Brian Berner	PowerGrid Components							X	Х	Х		Х
NVM	Sanket Bolar	Oncor						Х	^	X	X		X
NVM	Albane Bornuat	GE Grid Solutions								^	X	Х	X
NVM	Jeff Brogdon	Georgia Transmission Corporation	Tucker	GA							Х	^	
NVM	Arjon Bronsveld	Hitachi Energy Sweden	rucker	GA .							X		Х
NVM	Sudarshan Byreddy	Burns and McConnell									Х	Х	
NVM	Dave Collette	Mitsubishi Electric	Warrendale	Pennsylvania				Х	Χ	Χ	Х	^	
NVM	Ivan Contreras	ABB	- Trainemaare	- Cinibyrrama				, ·	Х				
NVM	Michael Crawford	Mitsubishi Electric	Cranberry Twp	Pennsylvania	Х		Х	Х	X	Χ	Χ	Х	
NVM	Katherine Cummings	G&W Electric	Bolingbrook	Illinois						Х			
NVM	Jason Cunningham	Southern States, LLC	Atlanta	Georgia	Х		Х	Χ	Χ		Χ	Χ	Х
NVM	Matthew Cuppett	Hitachi Energy									Х		Х
NVM	David Dart	Noja Power	'	_							Χ		
NVM	Patrick Di Lillo	Consolidated Edison Co. of New	New York	New York	Х	Χ	Χ	Χ	Χ	Р			
NVM	Federico Di Michele	CESI SPA	Milano	Milano			Χ	Х		Χ	Χ	Х	Χ
NVM	Boubacar Diallo	Southern States LLC	Fayetteville	Georgia			Χ			Х		Χ	
NVM	Lissy Diaz	Florida Power and Light	Jupiter	Florida							Χ		Χ
NVM	Jeffrey Door	The H-J Family of Companies	High Ridge	Missouri							Χ		Χ
NVM	Maxwell Eastman	Black and Veatch	Olathe	Kansas				Χ			Χ		
NVM	Douglas J Edwards	Siemens	Knightdale	North Carolina								Χ	
NVM	Ilya Glinsky	SCE									Χ	Χ	
NVM	Mauricio Gonzalez	Avangrid							Χ	Χ			
NVM	Sean Guidry	OMICRON Electronics							Χ				
NVM	Bruce Hack	National Breaker									Χ		
NVM	Stephanie Hayden	Meiden								Χ			
NVM	Jennifer Hunter	Mitsubishi Electric	Harmony	Pennsylvania			Χ	Χ	Χ			Χ	X
NVM	Richard Jackson	DTE	Troy	Michigan							Χ		
NVM	Sudesh Jaggernauth	FPL	Jupiter	Florida							Χ		Х
NVM	Darin Jensen	Southern States , LLC			_		Χ		Χ				
NVM	Jeffrey Jordan	Southern States, LLC							Χ				
NVM	Blair Kerr	B&W Electric									Χ		
NVM	Umer Khan	ABB									Χ	Χ	
NVM	Sangtae Kim	HICO America					Χ		Χ				
NVM	Yun Seong Kim	KERI						Χ			X		.,
NVM	Dwight Krause	Blach and Veatch									Χ	v	Χ
NVM	Hua Liu	Southern California Edison	Fairfiel-	Ohio							\ <u>'</u>	Χ	
NVM	Albert Livshitz	Qualus Services	Fairfield	Ohio						V	Χ	v	
NVM	Rafael Lopez	ABB								X		X	
NVM	Juan-Manuel Martinez	ABB Meiden America Switchgear	Peachtree	Georgia	V		V	Х	Х	X	Χ	Χ	
NVM	Paul Masterson David Mitchell	Mitch & Associates	Elizabeth	Colorado	X		X	X	X	X	X	Χ	
NI\/N/I	David Willell		FIIZANEUI	Colorado	^		^	^	Х	٨	٨	^	
NVM NVM	Stenhanie Montova												
NVM	Stephanie Montoya	MKI HICO America	Pittshurgh	Pennsylvania	Y			Y			У		У
NVM NVM	Anthony Natale	HICO America	Pittsburgh Chattanooga	Pennsylvania Tennessee	Х			Χ	X		Χ	Y	X
NVM			Pittsburgh Chattanooga Klaus	Pennsylvania Tennessee Vorarlberg	Х			X			X	Х	X

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NVM	Sharan Parikm	Duke Energy	Orlando	Florida							Х		
NVM	Mark Pattison	The H-J Family of Companies	Waterdown	Ontario							Χ		Χ
NVM	Conrad Pecile	Myers Power Products							Χ			Χ	Х
NVM	Mark Peterson	XCEL Energy	Minneapolis	Minnesota				Χ			Χ		Χ
NVM	Justin Rebovich	GE Grid Solutions									Х	Χ	Х
NVM	Samala Reddy											Χ	
NVM	Frank Richter	50Hertz Transmission							Χ				
NVM	Brian Roberts	Southern States	Hampton	Georgia				Χ	Χ		Χ		х
NVM	Sergey Rogozhkin	Tavrida Electric GmBH									Х		Х
NVM	Ryan Rowe	TCI Sales									Χ		Χ
NVM	Victor Savulyak	KEMA	Chalfont	Pennsylvania	Χ		Χ			Χ		Χ	Х
NVM	Jun Seo	HD Hyundai Electric							Χ				
NVM	Oleksandr Sergeyenko	Tavrida Electric North America Inc	Surrey	British Columbia				Χ		Χ			
NVM	John Sestito	Hyundai Electric							Χ		Χ		
NVM	Jamal Shah	Avangrid							Χ				Х
NVM	Devki Sharma	Retired	Halifax	Nova Scotia	Χ			Χ		Χ	Χ		
NVM	Aniket Shirode	ABB									Х		Х
NVM	Jerry Sneath	Electranix									Χ		
NVM	Lokesh Solanki	ABB					Χ				Х	Χ	Х
NVM	Jon Spencer	Utility Solutions	Catawba	North Carolina								Χ	Χ
NVM	Dragan Tabakovic	Hubbell Power Systems	Clearwater	Florida							Х	Χ	Х
NVM	Timothy Terry	Meiden America Switchgear, Inc.									Χ	Χ	Χ
NVM	Joseph Usner	AEP	Columbus	Ohio	Χ	Χ	Χ	Χ			Χ		
NVM	Jerry Wen	BC Hydro									Χ		
NVM	Michael Wong	Entergy	New Orleans	Louisiana							Χ		