

**Minutes of Meeting**  
**PC37.100.7 – Guide for the performance evaluation of SF6 alternatives**  
**Tuesday, April 18, 2023 – Clearwater, FL**

Meeting called to order by Dan Schiffbauer (Chair) at 8:00AM EST.

Introductions of people in attendance were made.

A quorum was established with 22 out of 36 voting members present.

The Meeting Agenda was presented by Dan Schiffbauer.

Motion to approve the agenda made by John Webb.

Seconded by Mike Crawford.

Agenda approved unanimously.

Patent slides were presented by George Becker. No patent issues presented by those in attendance.

The Minutes of Meeting (MOM) from the previous four meetings were presented.

Motion to approve the MOM made by Mike Crawford.

Seconded by Todd Irwin.

Minutes approved unanimously.

Review of subgroups was presented by Dan Schiffbauer.

Motion to disband all subgroups except the Comment Resolution Group made by Jon Rogers.

Seconded by Mike Skidmore.

Motion approved unanimously.

Review of the results of the Comment Resolution subgroup and a review of the ballot status was presented by Dan Schiffbauer.

Comment review of remaining comments was presented by Dan Schiffbauer.

Discussion of Comment R1-1 Technical commenced:

R1-1 Technical, must be satisfied

The voltage condition check may not be feasible for most medium voltage GIS, especially for those with multi-phase designs (all phases in one single gas tank) because their gas tanks are rather small and cramped with busbars, kinematic chain parts, insulating materials, and last but not least the actual switchgear of which the VI is but a component. Therefore, voltage condition check with reduced contact gap of any kind makes no sense for medium voltage GIS, i.e. a reduction to 90% of the normal open gap would be as unfeasible as a reduction to 25%.

Discussion of proposals for addition to the Guide:

- Keep power frequency test with reduced contact stroke as a method to verify vacuum integrity.
- Alternatively, confirm vacuum integrity using a contact force measurement (commenter).
- Alternatively, use a standard AC current source to check the arc voltage before and after M&E type tests to demonstrate vacuum integrity. L. Falkingham to provide some text.

Need to be able to verify VI integrity from data on the test reports – Carl Schuetz

Issues with the measurement of contact force on VI, need to look at other methods to verify. Complete condition checks need to be accomplished and then do VI integrity tests. Need a baseline contact force measurement – Pat Di Lillo

General descriptions of the VI condition verification methods should be discussed in the guide, at a high level. Specific tests and testing methods should be left to and produced in C37.09 – Arben Bufi

Agree with Arben Bufi on C37.09 scope for VI integrity testing method – Jan Weisker

The options to test VI integrity must be validated and not just proposals – Kennedy Darko

All comments and recommendations were noted by the chair.

The chair reviewed next steps which are to:

1. Incorporate working group proposals to resolve remaining technical comments in draft 4.2
2. Address remaining ballot group editorial comments in draft 4.2
3. Address remaining IEEE legal comments in draft 4.2
4. Have 10-day ballot recirculation #2
5. If the results are satisfactory – submit to REVCOM

Motion to include recommendations in the guide and to adjourn the meeting made by Dave Johnson.  
Seconded by Caryn Riley.  
Motion approved unanimously.

Meeting adjourned at 9:45AM EST.

Minutes respectfully submitted by George Becker, P.E., Vice Chair

Attendance:

Family Name	Given Name	Affiliation	4/18/23
Aldakka	Qais	Los Angeles Department of Water and Power	
Allingham	Edward	Hydro One	X
Almeida	Edwin	Southern California Edison	X
Aristizabal	Mauricio	Hitachi Energy	
Ashtekar	Koustubh	JST Power Equipment	X
Atere	Suraj	Exelon	
Ayers	Roy	Nashville Electric Service	
Baker	Daniel	LADWP	
Balasubramanian	Ganesh	Eaton Corporation	X
Bannink	Herman	KEMA Netherlands	
Barbera	Steven	Arizona Public Service	
Beckel	Andy	Xcel Energy	X

<b>Family Name</b>	<b>Given Name</b>	<b>Affiliation</b>	<b>4/18/23</b>
Becker	George	POWER Engineers Inc.	X
Beecher	Zack	Southern States LLC	
Berner	Brian	Power Grid Components	X
Beseda	David	S&C Electric Co.	
Bisewski	Bruno	RBJ Engineering Corp	
Boulus	Michael	PSE&G	
Bolar	Sankee	Oncor	X
Boyce	Russell	Eaton Corporation	
Bridges	Christopher	Eaton Corporation	X
Brogdon	Jeffrey	Georgia Transmission	X
Brooks	Adam	Duke Energy	X
Brown	Steven	Allen & Hoshall	
Brunke	John	POWER Engineers Inc.	
Bufi	Arben	Meiden America Switchgear, Inc.	X
Burse	Ted	Powell Industries, Inc	
Byron	Eldridge	Schneider Electric	
Cary	Stephen	Two Phase Solutions	
Chhabra	Mohit	S&C Electric Company	
Chiodo	Vincent	HICO	
Chovanec	Andrew	Power Grid Components	X
Cleaveland	Charles	Cleaveland/Price Inc.	
Coldsnow	Kent	Fort Collins Utilities	X
Collette	Lucas	Duquesne Light	X
Collette	Dave	Mitsubishi Electric	X
Connor	Brad	Xcel Energy	
Cosby	Bianca	San Diego Gas & Electric	
Crawford	Michael	Mitsubishi Electric Power Products, Inc.	X
Crist	Daniel	Siemens Industry, Inc.	
Culhane	Michael	Eaton	
Cunningham	Jason	Southern States, LLC	X
Darko	Kennedy	G&W Electric Co.	X
Dhawan	Anil	ComEd	
Di Lillo	Patrick	Consolidated Edison Co. of NY, Inc.	X
Di Michele	Federico	CESI S.p.A.	
Door	Jeffrey	The H-J Family of Companies	
Duncan	Kirk	Hitachi T&D Solutions	
Dwyer	Bernie	PECO	
Edwards	Ken	FirstEnergy Corp.	
Edwards	Doug	Siemens Industry, Inc.	
Eftink	Emily	Burns & McDonnell	
Evans	Aaron	HICO America	
Fender	Karl	Southern States LLC	

<b>Family Name</b>	<b>Given Name</b>	<b>Affiliation</b>	<b>4/18/23</b>
Fennell	Howard	Nashville Electric Service	
Frazier	Raymond	Ameren	
French	Christopher	Eaton Corporation	
Frye	Richard	Eaton	
Gerzeny	Brian	Powell Electrical Systems Inc	X
Glaesman	Peter	PCORE Electric Company, Inc.	
Glinsky	Ilya	Southern California Edison	
Grahor	Lou	Eaton Corporation	
Hall	John	Tennessee Valley Authority	
Harley	Jackie	First Power Group LLC	
Hastreiter	Christopher	Eaton	
Heiermeier	Helmut	ABB	
Heintzelman	Travis	Burns & McDonnell	
Hensberger	Jeremy	Mitsubishi Electric Power Products Inc.	X
Hermosillo	Victor	GE Grid Solutions	
Hester	Edward	Entergy	
Hohnstadt	Ben	DTE Energy	
Hu	Joanne	RBJ Engineering Corporation	
Hunter	Jennifer	MEPPI	
Hutchins	Roy	Southern Company Services	
Hyjek	Katarzyna	DTE	
Hyoung Jin	JOO	Hyundai Electric	
Irwin	Todd	GE Grid Solutions	X
Jacobs	Allan	Eaton Corporation	
Jagadeesan	Bharatwaj	Southern States LLC	
Jain	Rahul	S&C Electric Company	
Jarnigan	Christopher	Southern Company Services	X
Jasinski	Joseph	ITC Holdings Corp.	
Jensen	Darin	Meiden America Switchgear, Inc.	
Johnson	David	HVCB	X
Johnson	Travis	Xcel Energy	X
Jung	Wolfgang	Siemens AG	
Kandel	Jackie	Powell Industries, Inc	X
Kang	Jun	Hyundai Electric	
Keels	Thomas	kEElectric Engineering	
Kim	David	Hyundai Electric	
Kim	SangTae	HICO America	
Kim	jungdae	hyosung	
Kim	Yun Seong	KERI	X
Kowalik	Peter	Cleaveland/Price Inc.	
Kurinko	Carl	Hitachi Energy	
Lan	Bob	nVent Hoffman	X

<b>Family Name</b>	<b>Given Name</b>	<b>Affiliation</b>	<b>4/18/23</b>
Lanning	Scott	S&C Electric	
Lao	Billy	Dilo Company, Inc.	X
Laso Rubio	Andres	G&W Electric Co.	
Lavrinoff	Benedict	Kinectrics	
Leccia	Brad	Eaton	
LEE	JOOHYUN	HYOSUNG	
LEE	CHANG HOON	HYOSUNG Heavy industries	X
Lee	Yong Woo	KERI	X
Lemmerman	David	PECO/Exelon	
Leopard	Dakota	Eaton Corporation	
Leufkens	Paul	Power Projects Leufkens	
Li	Jialin	Hydro One	
Li	Wangpei	Eaton	
Ling	Yingjie	GE	
Liu	Hua Ying	Southern California Edison	
Lo	Benson	Toronto Hydro	
Lopez	Leo	WIKA Instrument, LP	X
Ma	Chunming	Burns and McDonnell	
Mannarino	Antonio	PSE&G	
Mantilla	Javier	Hyundai Electric Switzerland	
Marshall	Vincent	Southern Company Services	
Martin	Donald	G&W Electric Co.	
Marx	Benjamin	Sargent and Lundy	
Marzec	Peter	S&C Electric Co.	
Mason	Douglas	ComEd	
Masterson	Paul	Meiden America Switchgear, Inc.	
May	Steven	Southern Company	X
McCord	Neil	KEC Precision	X
Meiners	Steven	Retired	
Methling	Ralf	Leibniz Institute for Plasma Science and Technology	
Midkiff	Jacob	Dominion Energy	
Milnikel	Henning	Siemens	
Mitchell	David	Southern States	X
Monroe	Andrew	Southern Company	
Moran	Ashley	IEEE Standards Association (IEEE-SA)	
Mucha	Martin	G&W Electric	
Mulakken	Nikil	Facebook	
Natale	Anthony	HICO America	
Nayar	Raj	Siemens	
Nelson	Jacob	HPS	
Nelson	Jeffrey	Tennessee Valley Authority	
Nenjahr	Jonathan	Eaton	X

<b>Family Name</b>	<b>Given Name</b>	<b>Affiliation</b>	<b>4/18/23</b>
ONeil	Brian	RMS Energy	
Ordein	Fernando	Dominion Energy	X
Owen	John	Powertech Labs	X
Owens	John	3M	
Palmer	Justin	ELECTRONSYSTEM MD	
Patel	Pathik	Duke Energy	
Patil	Lalit	Eaton Corporation	X
Pattison	Mark	H-J Family of Companies	
Pellerito	Thomas	DTE Energy	
Perrin	Damian	Entergy Services, LLC.	
Peterson	Mark	Xcel Energy	X
Phan	Lise	Pacific Gas and Electric Company	
Phouminh	John	PEPCO HOLDINGS, INC.	
Polchinski	Craig	MEPPI	
Pounders	Isaac	Meiden America Switchgear, Inc.	X
Pruitt	Al	The Durham Company	
Putman	Larry	Powell	X
Raja	Laxminarayan	University of Texas	X
Ranjan	Rakesh	Esgee Tech	
Reid	Laura	Hubbell Power Systems	
Reit	Cristian	Doble Engineering Company	
Rexroad	Aaron	Meiden America Switchgear, Inc.	
Ricciuti	Anthony	Eaton	
Rich	Bobby	Dominion Energy	
Riley	Caryn	Georgia Tech/NEETRAC	X
Ringham	Grant	BC Hydro	
Roberts	Brian	Southern States, LLC	X
Rogers	Jon	Siemens Energy, Inc.	X
Rohr	Richard	Powell Electrical Systems	
Rokser	Ian	Eaton Corporation	X
Rostron	Joe	Southern States LLC	
Rowe	Ryan	TCI Sales	X
Ruebensam	James	S&C Electric Co.	
Salas	Oscar J.	Duke Energy	X
Salinas	Alex	Doble Engineering Company	X
Santos	Leonel	Schneider Electric	X
Savulyak	Victor	DNV GL KEMA Laboratory	
Sazanowicz	Robert	Avangrid - United Illuminating	
Schaben	Chase	Burns & McDonnell	
Schiffbauer	Daniel	Toshiba International Corporation	X
Schuetz	Carl	American Transmission Company (ATC)	X
Schumann	Jon	American Transmission Company	

<b>Family Name</b>	<b>Given Name</b>	<b>Affiliation</b>	<b>4/18/23</b>
Scott	Jeff	Ameren	
Sestito	John	Hyundai electric	
Sharma	Devki	Entergy	
Shiller	Paul	First Power Group LLC	X
Shinde	Sushil	Hitachi Energy	
Sicker	Robert	FirstEnergy Corp	
Siena	Matthew	Duke Energy	
Sims	Garett	Eaton Corp.	
Skidmore	Michael	AEP	X
Slattery	Christopher	First Energy	
Smith	Kirk	Retired	
Soulard	Francois	Hydro Quebec	
Stage	James	Dominion Energy	
Steigerwalt	Don	Duke Energy	
Stemmerich	Joe	Trayer Engineering Corp.	
Stoller	Patrick	Hitachi Energy	
Tabakovic	Dragan	Meramec Hubbell Power Systems	X
Tarleton	John	Southern States, LLC	
Tillery	Tim	Howard Industries	
Torres	Jean-Marc	Meramec Hubbell Power Systems	
Toups	Vernon	Siemens	X
Trichon	Francois	Schneider Electric	X
Trost	Karla	G&W Electric	
Tuveson	Lars	Burns & McDonnell	
Usner	Joe	AEP	X
Uzelac	Nenad	G&W Electric Co.	
van de Ligt	James	CANA High Voltage Ltd.	
Waldron	Mark	National Grid	
Ward	Jeffrey	Doble Engineering Company	
Webb	John	ABB	X
Weeks	Casey	Siemens Energy	X
Weisker	Jan	Siemens Energy	X
Wen	Jerry	BC Hydro	
Westerdale	Matt	Bureau of Reclamation	
Whitney	Michael	CSA America	
Wilkie	William	Eaton Corporation	
Wirz	Torsten	ABB AG	
Wolf	Robert	Hubbell Power Systems, Inc.	
Wolfe	Dan	MEPPI	X
Woodyard	Terrance	Siemens Industry Inc.	
Xiao	Ang	3M company	
York	Richard	Mitsubishi Electric Power Products, Inc.	X

<b>Family Name</b>	<b>Given Name</b>	<b>Affiliation</b>	<b>4/18/23</b>
Youssef	Mina	Eaton Corporation	
Yu	Li	Eaton Corporation	X
Zaharko	Samuel	MEPPI	
Zehnder	Lukas	Hitachi Energy	
Zhang	Wei	Southern Company	
Zhang	Jiong	MEPPI	
Zhong	Jim	American Transmission Company	
Zhou	Xin	Eaton Corporation	