

Minutes of Meeting

September 21, 2015

WG: C37.04 - Standard Ratings and Requirements for AC High Voltage Circuit Breakers with rated maximum voltage above 1000 V

Chair: Stephen Cary

Vice Chair: Mike Crawford

Secretary: Roy Alexander

Location: San Diego

Participants: 72 (33 members 39 guests)

- Introductions
- MOM was posted and no negative comments received, MOM are approved by default
- It was noted PAR extension applied for two year extension
- 205 comments submitted, all but one was resolved (Trip Free). The following topics were discussed during the meeting:
 - 5.5.2.4: de-rating: mechanical duty limits are set to limit so many ops per hour. Reference section 5.10 in 1999 version. – See comment resolution for additional detail
 - 5.5.2.5: Will add E2 as an optional rating and one T100; will better clarify statement with Sushil. E2 shall be introduced into IEEE just as it is in IEC so that no IEC vs. IEEE E2 confusion. IEEE will have a minimum require that is NOT IEC E1.
 - 5.9.1: add minimum interrupting time as defined in comments, $0.75 \times 1/2$ cycle; WG accepted the proposal with revision to $3/8$ cycle.
 - 7.4.1 a): Trip Free – General consensus of group was proposal to change to 37-013 generator breaker standard definition was rejected. C37.04 definition as it current exists will be used for the ballot
 - TRV section written by Kirk Smith has been implemented with some sections moving into Dennis Dufournet application guide C37.011. Revisions with tracked changes have been sent.
 - 7.4.4 Electromagnetic Controllers: Reword requirement that capacitors shall be maintainable or replaceable. John Webb and Eldridge Byron are reviewing the wording. May delete requirement of mean time to failure to satisfy comment.
 - 7.4.1: Require drawout breakers to be completely enclosed, new bullet 'g'. See wording in C37.20.1 (J. Webb), to establish end user safety requirements.
 - Sound limit requirements: Reference C37.082. Note it is a manufacturer responsibility to check sound limit, but that it does not require special sound room.
 - X-Rays at 15kV and less: Requirement is found in C37.85, does not apply to C37.04. C37.85 is a reference document to C37.04 as is.
 - 260 OHM bus surge impedance for iTRV in standard now; will stay as 260 OHM.
 - t' used in TRV time delay AND operating duty: t_r shall be new term for operating duty.
 - Showed C37.04 definitions: remove 'actual TRV' (#1 on slide), remove one-cosine,

- Figure 1 to be coordinate with C37.09
- Figures 12-16 being re-created by M. Crawford to satisfy comment.
- Bibliography to be worked on by J. Webb. and Jim van de Ligt
- C37.20.2 Grey box requirements can be moved into C37.04 (J. Webb)
- Next move: Prepare document for ballot by December 2015.

Attendance:

First Name	Last Name	Company	City	State	Country
Roy	Alexander	RWA Engineering	Cranberry Twp.	PA	USA
Mauricio	Aristizabal	ABB	Pittsburgh	PA	USA
Aasim	Atiq	Siemens Energy	Madison	MS	USA
George	Becker	Electric Power Research Institute	Guilford	CT	USA
Stan	Billings	Mitsubishi Electric PP	Warrendale	PA	USA
Raymond	Browning	FirstEnergy Corp.	Copley	OH	USA
John	Brunke	Whidbey	Fuseland	WA	USA
Arben	Bufi	Hitachi HVB, Inc.	Suwanee	GA	USA
Ted	Burse	Powell Industries, Inc	Houston	TX	USA
Eldridge	Byron	Schneider Electric	Smyrna	TN	USA
Donald	Cantrelle	Georgia Power	Forest Park	GA	USA
Gilbert	Carmona	Southern California Edison	Pomona	CA	USA
Stephen	Cary	GE Energy Management	Chapel Hill	NC	USA
Steven	Chen	Eaton Corporation	MOON TOWNSHIP	PA	USA
Chih	Chow	PEPCO	Washington	DC	USA
Michael	Christian	ABB	Lake Mary	FL	USA
Lucas	Collette	Mitsubishi Electric	Warrendale	PA	USA
Michael	Crawford	Mitsubishi Electric	Cranberry Twp	PA	USA
Jason	Cunningham	Hitachi HVB, Inc.	Suwanee	GA	USA
Patrick	Di Lillo	Consolidated Edison Co. of NY, Inc.	New York	NY	USA
Denis	Dufournet	Retired	Sathonay-Camp	Other	France
John	Eastman	INCON	Saco	ME	USA
Ken	Edwards	Bonneville Power Administration	Vancouver	WA	USA
Robert	Foster	Megger	Paradise	CA	USA
Anne	Good	Net Shape Technologies	Nashville	TX	USA
John	Hall	Tennessee Valley Authority	Chattanooga	TN	USA
Helmut	Heiermeier	ABB	Baden	Other	Switzerland
Charles	Hendrickson	Arizona Public Service Company	Phoenix	AZ	USA
Victor	Hermosillo	Alstom Grid	Charleroi	PA	USA
Roy	Hutchins	Southern Company Services	Birmingham	AL	USA
Todd	Irwin	Alstom Grid Inc	Smithville	MO	USA
Joseph	Jasinski	Transco	Novi	MI	USA
Amir	Khosravi	BC Hydro	Vancouver	Other	Canada

Carl	LaPlace	GE	Raleigh	NC	USA
Alex	Lee	HICO	LA	CA	USA
Hua Ying	Liu	Southern California Edison	Pomona	CA	USA
Albert	Livshitz	CE Power Solutions	Loveland	OH	USA
Antonio	Mannarino	PSE&G	Springfield	NJ	USA
Vincent	Marshall	Southern Company Services	Forest Park	GA	USA
Ricardo	Martinez	CFE	Irapuato	Other	Mexico
Peter	Marzec	S&C Electric Co.	Chicago	IL	USA
Joel	Mathewson	Siemens	Jackson	MS	USA
Neil	McCord	Southern States	Hampton	GA	USA
Dave	Mitchell	Dominion	Richmond	VA	USA
Oscar	Montano	srpnet	Phoenix	AZ	ISA
Tom	Mulcahy	Dominion Virginia Power	Richmond	VA	USA
Thomas	Pellerito	DTE Energy	Detroit	MI	USA
Anthony	Ricciuti	Eaton Corporation	Moon Township	PA	USA
Dave	Riffe	Westinghouse Electric Company	New Stanton	PA	USA
Brian	Roberts	Southern States, LLC	Hampton	GA	USA
Roderick	Sauls	Southern Company Services	Birmingham	AL	USA
Carl	Schuetz	American Transmission Company	Waukesha	WI	USA
Jon	Schumann	American Transmission Company	Waukesha	WI	USA
Devki	Sharma	Consultant	Byram	MS	USA
Harish	Sharma	Southern Company	Birmingham	AL	USA
Sushil	Shinde	ABB Inc.	Mt Pleasant	PA	USA
John	Shullaw	Retired -GE	Butlington	IA	USA
Michael	Sigmon	Eaton	Greenwood	SC	USA
Michael	Skidmore	AEP	Pickerington	OH	USA
Erin	Spiewak	IEEE	Piscataway	NJ	USA
Don	Steigerwalt	Duke Energy	Charlotte	NC	USA
Ahmad	Qasem	Bechtel	Houston	TX	USA
Humayun	Tariq	American Electric Power	Gahanna	OH	USA
Vernon	Toups	Siemens	Richland	MS	USA
James	van de Ligt	CANA High Voltage Ltd.	Calgary	AB	Canada
John	Webb	ABB	Florence	SC	USA
Casey	Weeks	Siemens Energy	Richland	MS	USA
Jan	Weisker	Siemens AG	Berlin	Other	Germany
Matt	Williford	Schneider Electric	Smyrna	TN	USA
Jiong	Zhang	MEPPI	West Covina	CA	USA
Wei	Zhang	Hitachi HVB, Inc.	Suwanee	GA	USA
Xi	Zhu	GE Energy Management	Atlanta	GA	USA