

DRAFT – To be approved at the next Working Group meeting in April 2024

C37.100.2 Working Group - Meeting October 11, 2023, convened at 1:30 pm

Revising C37.100.2-2018 IEEE Standard for Common Requirements for Testing of AC Capacitive Current Switching Devices over 1000 V

Kirk Smith, Chair

Meeting minutes taken by Peter Glaesman, Secretary

Total Attendees: 36; including 13 of 29 members, and 23 guests.

Welcome

Introductions made with affiliations and passed attendance sheet (Attached as Exhibit 1).

Approval of Spring meeting minutes and the September 12, 2023 virtual meeting - Michael Christian – Motioned to approve and Neal McCord seconded.

Request was made for a vice-chair made. Neal McCord offered to serve as vice-chair.

Two virtual meetings were proposed prior to the Spring 2024 Switchgear Meeting.

iMeet Central discussion. Suggested to contact Jennifer Santulli with IEEE, if having trouble accessing this site.

C37.100.2 WG's page under iMeet Central was displayed and discussed.

Neal McCord offered additional references to be placed in iMeet Central.

Kirk Smith presented IEEE Patent Slides and Copyright Slides.

Technical Topics:

A: Open wire line dropping: Slide presentation prepared by Jeff Brogdon and presented by Luke Collette. The slides will be uploaded to iMeet Central.

Based on data, Table 5 from C37.012-2022 is proposed to be accepted for use in C37.100.2

kc factor = 1.2 covers all cases, kc factor = 1.4 covers the majority of cases.

Neal McCord asked if Lucas Collette would you recommend updating the kc factor = 1.2 to kc factor = 1.4. Lucas Collette said he would not.

At kc factor = 2.1, Lines are considered grounded. (????)

Neal McCord questioned the kc factor = 1.7 in Table 5. Why would you ever pick kc factor = 1.7? Jan Weisker said that this factor comes from harmonization with IEC. It is common in Europe.

Neal McCord requested that Table 5 language be made clearer. He asked that the actual language from subclause 4.5.3 on page 18 of the 2018 standard be updated. Recommended to replace the language with a table.

Pete Kowalik asking about kc factor = 1.4 shown in the slides.

Jan Weisker suggested to add a kc factor = 1.5 to the table, and to and keep kc factor = 1.7.

B: Impact of Line to Ground Fault: Jan Weisker said IEC uses a special annex for this to allow only one test duty. He suggested WG look at Annex in IEC “-100”.

C: Controlled Switching: Jan Weisker presented slides. Slides will be uploaded to iMeet Central.

Kirk Smith offered comments on slides.

Jan Weisker suggests a C1 test without the controller. Two options presented in slides.

Neal McCord, Brian Roberts, and Andrew Chovanec will offer a proposal to use a resistor insertion as a test alternative.

D: Review of single and Three Phase test steps at 10 deg and 30 deg

Jan Weisker said he had already provided a summary of this topic. (This contribution was found and will be added to iMeet Central.)

E: Consider Change to C2 Number of Restrikes allowed for Distribution Capacitor Switches

See agenda details provided by Kirk Smith.

Neal McCord described a windfarm anecdote where high numbers of switching operations are occurring regularly; up to six times per day. So, 1200 operations are not even close to 10 years of equipment life in some applications.

“Enough 38 kV capacitor banks have failed that industry is crying for improvement in the standard.”

Carl Fender (formerly with Cooper Power, and now with Southern States) may be able to help answer the restrike question.

Michael Christian asked about specifying a restrike-free capacitance switch. Kirk Smith and Neal McCord said industry history indicates there is “no such thing” as a restrike free

capacitance switch. Michael Christian suggested there are new devices using zero-crossing technology that achieve this.

Neal McCord disagreed and said reality is that “no-restrike free equipment” is only theoretical and exists only on a “drafting board”, suggesting there is too much variability in the field to make this reality. He asked if a “no-restrike switch” (C3 rating?) were offered, what would the testing requirements be. Harry Hirz pointed out that a zero-restrike device is impossible to test because you can’t do enough operations to confirm “no-restrikes”.

Michael Christian will propose a C3 category for a device that does NOT restrike. The test will be for zero restrikes in a “high” number of operations (to be determined).

Kirk Smith brought the WG back to the agenda and per the Topic E details asked for a straw poll of who would agree to the increase from 2 restrikes for a C2 rating be increased to 5 restrikes in for a C2 rating and no one but Kirk raised their hand.

Lucus Collette said utilities need other approach than what is described in the standard. He said for their utility, “Regulation begins out on the lines and works back toward the substation.”

Kirk Smith proposed virtual meetings for mid-December and mid-February time frames, as needed. Neal McCord was in agreement with this, and no one opposed it.

The timeline for completing the document was discussed along with possibility of needing a PAR extension.

Meeting opened for discussion:

Neal McCord said many readers of C37.100.2 don’t know how to use this standard. He asked if the WG understood that this standard is for capacitance current switching and NOT capacitor switching. No response was made. As an example of not understanding the standard as written, Neal pointed to the 4.0 Design tests and switching rating information in clause 4.3. He said items a. through j. need to be clarified. Some of these items are to be specified and some of these items will be identified by the results of the testing.

Meeting adjourned at 3:20 pm.

C37.100.2 Roster and Attendance - October 11, 2023 (session I of I)

Full Name	Affiliation	Member Status	Initial if Present
Antone Bonner	Power Analysis and Solutions Consulting, LLC	member	N
Brian Roberts	Southern States	member	Y
Chris Borck	Eaton	member	N
Chris Morton	Powertech Labs Inc.	member	N
Chuck Corley	Eaton	member	N
Damian Perrin	Entergy Services LLC	member	N
Dan Schiffbauer	Toshiba International Corporation	member	N
Don Steigerwalt	Duke Energy	member	N
Donald Swing	Powell Industries	member	N
Dragan Tabakovic	Hubbell	member	N
Harry Hirz	G&W Electric	member	Y
Jan Weisker	Siemens Energy	member	Y
Jeff Brogdon	Georgia Transmission	member	N
Jennifer Santulli	IEEE - SA	staff	N
Jim Van De Ligt	CANA High Voltage Ltd.	member	N
John Webb	ABB	member	Y
Lucas Collette	Duquene Light	member	Y
Marcus Young	Mitsubishi Electric	member	Y
Michael Christian	ABB	member	Y
Neil McCord	KEC Precision LLC	member	Y
Pete Kowalik	Cleveland/Price Inc.	member	Y
Peter Glaesman	PCORE Electric co.	secretary	Y
Rob Ross	Cleveland/Price	member	N
Robert Kirkland Smith	Retired	chair	Y
Roy Alexander	RWA Engineering	member	N
Samuel Zarharlo	MEPPI	member	N
Sergio Flores	Schneider Electric Inc, USA	member	Y
Ted Burse	Powell Industries	member	N
Vincent Marshall	Southern Company	member	Y

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Full Name	Affiliation	Member Status	Initial if Present
Carl Kurinko	Hitachi Energy	guest	Y
Andrew Chovanec	Power Grid Components	guest	Y
Andy Beckel	Xcel Energy	guest	Y
Arben Bufi	MAS Inc.	guest	Y
Brad Leccia	Eaton	guest	Y
Casey Weeks	Siemens Energy	guest	Y
Chris Ekpoudom	Southern States	guest	Y
Chunming Ma	Burns and McDonnell	guest	Y
Conrad Pecile	Meyers Power Products	guest	Y
Dan Wolfe	MEPPI	guest	Y
Ganesh Balasubramanian	Eaton	guest	Y
Gary Meeking	Southern States	guest	Y
Jeff Jordan	Southern States	guest	Y
John Tarleton	Southern States	guest	Y
June Seo	HD Hyundai Electric	guest	Y
Kaylor Garcia	Utility Solutions, Inc.	guest	Y
Lin Tong	TK Switchgear	guest	Y
Mark Peterson	Xcel Energy	guest	Y
Pedro Castillo	ABB	guest	Y
Samuel Anris	KEMA Labs	guest	Y
Tim Anderson	Aluma-Form	guest	Y
Victor Savulyak	KEMA Labs	guest	Y
Yong Woo Lee	Keri	guest	Y