

Minutes of Meeting

Working Group C37.010 – Application Guide for AC High-Voltage Circuit Breakers > 1000 VAC Rated on a Symmetrical Basis

Location: Catamaran Resort (San Diego CA)
Date: Monday October 9, 2023 (1:30-3:15PM PST)
Quorum: Membership Count: **41** Members Present: **35**

Agenda

Andy Keels w/ kEElectric Engineering, LLC called the meeting to order and presented the agenda.

Introduction of Members and Guests

68 Total in Attendance (**35** Members, **33** Guests) – Quorum Achieved

Review of Attendance Logging via IEEE Attendance Tool

See meeting slides for details

Review of Reference Documents loaded into IMeetCentral

Request to Load Contributions into IMeetCentral

- Jan Weisker performed requested IEC document review and sent results to the Chair
- Kirk Smith provided review of C37 documents (within scope requested) and sent results to the Chair.

Review of Request to Membership Chief Engineer Input

Chair previously requested the membership reach out to their Chief Engineers for input into C37.010 with respect to revision requests that should be included in this revision cycle. The following points of contact were identified to submit this request:

- a. Casey Weeks/Jon Rogers – Siemens Energy
 - b. Carl Kurinko – Hitachi Energy
 - c. Todd Irwin/Victor Hermisillo - GE
 - d. Jeremy Hensberger/Michael Crawford – Mitsubishi Electric
 - e. Arben Bufi - Meiden America Switchgear
 - f. John Webb - ABB
 - g. Anthony Ricciuti - Eaton
- ➔ Result: No additional input provided.

Arben Bufi presented “Discussions on User Specified 110% Voltage Duty”

- See slides in Meeting Minutes
 - o Recommend to affirm the decision of the IEEE PES SWGR Committee in June 2019 that an increase in rated maximum voltage not be approved at this time.
 - o Provided some proposed text to add to Subclause 4.2.

Discussion

- o IEEE PES Switchgear 2019 decision was intended to keep C84.1 from raising the voltage duty values
- o IEEE 1547 raised this issue and states equipment shall be able to operate at 110%
- o Victor Hermosillo recommended the standard provide more guidance on how to increase the values, for example:

- Adjust first pole factors or interrupting current rating
 - Similar guidance methods have been provided for X/R or thermal limits.
- Emphasis was provided that this is a guide on how to apply the breaker and should not change design values

Carl Schuetz presented Sub-Group Update on User-Specified 110% System Nominal Voltage Duty

- See slides in Meeting Minutes
- Intention is to provide guidance for Users who choose to or must operate above rated voltages to avoid FERC violations
- Not intended to change the rating structure. That is the responsibility of C37.04 and C37.09.
- IEEE 2800 lets inverter come online 10% above system nominal voltage (5% above rated maximum voltage)
 - Noted in document that need to check reference to circuit breaker standards
- IEEE Paper was reviewed on the subject of pre-TRV rating structure
- Todd Irwin Comment to Proposal #2: C84.1 should reference C37.04

Dan Benedict (PPL): Questions about Table 6 & Table 7

- See minutes slides
- Discussion was postponed due to meeting time constraints.

Approval of the meeting minutes was presented for meeting dates of October 2022, February 2023, April 2023 and July 2023.

Motion: Approve ALL Minutes in one vote: Pat Dilillo

2nd to the Motion: Carl Schuetz

Vote: Approved without objection/abstention

Motion: Approve ALL Minutes for October 2022, February 2023, April 2023, July 2023: Carl Schuetz

2nd to the Motion: Marcus Young

Vote: Approved without objection/abstention

Schedule

Next Virtual Meeting: January 17th 2024, 11:00 EST

Next in-person meeting: March 31st – April 4th, 2024 at the Westin Fort Lauderdale, Florida

Chair requested an additional session of C37.010 for 10/12/2023 at 8:00am. This session was granted approval by the PES Committee Officers.

Adjournment

Motion: Adjourn Meeting: Pat Dilillo

2nd to the Motion: Kirk Smith

Vote: Approved without objection/abstention

Meeting adjourned by the chair at 3:15 (PST) on 10/9/2023.

Reported by:

Jeremy Hensberger & Andy Keels

IEEE PES Switchgear Committee C37.010 Workgroup October 9, 2023 In-Person Meeting Attendance				
Count	Breakout	Name	Affiliation	Status
1	C37.010 HVCB Applications Guide WG Meeting	Bartels, Alexander	Powell Industries, Inc.	Guest
2	C37.010 HVCB Applications Guide WG Meeting	Becker, George	POWER Engineers, Inc.	Member
3	C37.010 HVCB Applications Guide WG Meeting	Benedict, Dan	PPL Corporation	Member
4	C37.010 HVCB Applications Guide WG Meeting	Berner, Brian	Power Grid Components Inc.	Guest
5	C37.010 HVCB Applications Guide WG Meeting	Bolar, Sanket	Oncor Electric	Guest
6	C37.010 HVCB Applications Guide WG Meeting	Bufi, Arben	Meiden America Switchgear	Member
7	C37.010 HVCB Applications Guide WG Meeting	Castillo, Pedro	ABB Ltd.	Guest
8	C37.010 HVCB Applications Guide WG Meeting	Chovanec, Andrew	G&W Electric Company	Member
9	C37.010 HVCB Applications Guide WG Meeting	Christian, Michael	ABB Ltd.	Member
10	C37.010 HVCB Applications Guide WG Meeting	Collette, Dave	Mitsubishi Electric Corporation	Guest
11	C37.010 HVCB Applications Guide WG Meeting	Collette, Lucas	Duquesne Light Co.	Member
12	C37.010 HVCB Applications Guide WG Meeting	Contreras Montante, Ivan	ABB Ltd	Guest
13	C37.010 HVCB Applications Guide WG Meeting	Crawford, Michael	Mitsubishi Electric Power Products, Inc. (MEPPI)	Member
14	C37.010 HVCB Applications Guide WG Meeting	Cunningham, Jason	Southern States LLC	Guest
15	C37.010 HVCB Applications Guide WG Meeting	DIALLO, BOUBACAR	Southern States LLC	Guest
16	C37.010 HVCB Applications Guide WG Meeting	Di Lillo, Patrick	Consolidated Edison Co. of NY, Inc.	Guest
17	C37.010 HVCB Applications Guide WG Meeting	Door, Jeffrey	The H-J Family of Companies	Guest
18	C37.010 HVCB Applications Guide WG Meeting	Gonzalez Araque, Javier	AVANGRID	Guest
19	C37.010 HVCB Applications Guide WG Meeting	Guidry, Sean	OMICRON electronics Corp. USA	Guest
20	C37.010 HVCB Applications Guide WG Meeting	Hanna, Robert	JST Power Equipment Inc	Member
21	C37.010 HVCB Applications Guide WG Meeting	Hensberger, Jeremy	Mitsubishi Electric Power Products Inc	Member
22	C37.010 HVCB Applications Guide WG Meeting	Hermosillo, Victor	GE Grid Solutions	Member
23	C37.010 HVCB Applications Guide WG Meeting	Hunter, Jennifer	MEPPI-Warrendale Pa	Member
24	C37.010 HVCB Applications Guide WG Meeting	Irwin, Todd	GE Grid Solutions	Member
25	C37.010 HVCB Applications Guide WG Meeting	Jarnigan, Christopher	southern company/ southern nuclear	Member
26	C37.010 HVCB Applications Guide WG Meeting	Jordan, Jeffrey	Southern States LLC	Guest
27	C37.010 HVCB Applications Guide WG Meeting	Keels, Thomas Andy	kEElectric Engineering, PLLC	Member
28	C37.010 HVCB Applications Guide WG Meeting	Kim, Sangtae	HICO America	Guest
29	C37.010 HVCB Applications Guide WG Meeting	Kurinko, Carl	Hitachi Energy	Member
30	C37.010 HVCB Applications Guide WG Meeting	lee, changhoon	Hyosung Industries Co. / GIS development	Guest
31	C37.010 HVCB Applications Guide WG Meeting	Lee, Yongwoo	Korea Electrotechnology Research Institute(KERI)	Guest
32	C37.010 HVCB Applications Guide WG Meeting	Livshitz, Albert	Schneider Electric	Member
33	C37.010 HVCB Applications Guide WG Meeting	Lopez, Adrian	Powell Industries, Inc.	Guest
34	C37.010 HVCB Applications Guide WG Meeting	Ma, Chunming	Burns & McDonnell	Guest
35	C37.010 HVCB Applications Guide WG Meeting	Marshall, Vincent	southern company/ southern nuclear	Member
36	C37.010 HVCB Applications Guide WG Meeting	MARZEC, PETER	S and C Electric Co	Guest
37	C37.010 HVCB Applications Guide WG Meeting	May, Steven	Southern Company Services	Member
38	C37.010 HVCB Applications Guide WG Meeting	Mc Cord, Neil	KEC Precision LLC	Guest
39	C37.010 HVCB Applications Guide WG Meeting	Mitchell, David	Southern States LLC	Member
40	C37.010 HVCB Applications Guide WG Meeting	Montoya, Stephanie	MKI	Guest
41	C37.010 HVCB Applications Guide WG Meeting	Orosz, Miklos	CBT&S Consulting LLC	Member
42	C37.010 HVCB Applications Guide WG Meeting	Palazzo, Mirko	ABB Ltd.	Guest
43	C37.010 HVCB Applications Guide WG Meeting	park, eunhye	KEPCO Inc.	Guest
44	C37.010 HVCB Applications Guide WG Meeting	Pecile, Conrad	Myers Power Products, Inc,	Guest
45	C37.010 HVCB Applications Guide WG Meeting	Peterson, Mark	Xcel Energy	Guest
46	C37.010 HVCB Applications Guide WG Meeting	Polchinski, Craig	Mitsubishi Electric Corporation	Member
47	C37.010 HVCB Applications Guide WG Meeting	Pounders, Isaac	Meiden America Switchgear	Guest
48	C37.010 HVCB Applications Guide WG Meeting	Rexroad, Aaron	Meiden America Switchgear inc.	Member
49	C37.010 HVCB Applications Guide WG Meeting	Ricciuti, Anthony	Eaton Corporation	Member
50	C37.010 HVCB Applications Guide WG Meeting	Roberts, Brian	Southern States LLC	Guest
51	C37.010 HVCB Applications Guide WG Meeting	Salinas, Alex	Doble Engineering Company	Guest
52	C37.010 HVCB Applications Guide WG Meeting	Santulli, Jennifer	; ieee sa	Member
53	C37.010 HVCB Applications Guide WG Meeting	Schuetz, Carl	American Transmission Company	Member
54	C37.010 HVCB Applications Guide WG Meeting	Scott, Jeffrey	Ameren Services	Member
55	C37.010 HVCB Applications Guide WG Meeting	Smith, R Kirkland	IEEE member / Self Employed	Member
56	C37.010 HVCB Applications Guide WG Meeting	Steigerwalt, Donald	Duke Energy Corporation	Member
57	C37.010 HVCB Applications Guide WG Meeting	Tarleton, John	Southern States LLC	Guest
58	C37.010 HVCB Applications Guide WG Meeting	toups, vernon	Siemens Energy, Inc.	Member
59	C37.010 HVCB Applications Guide WG Meeting	Ward, Jeffrey	Doble Engineering Company	Member
60	C37.010 HVCB Applications Guide WG Meeting	Webb, John	ABB Ltd.	Guest
61	C37.010 HVCB Applications Guide WG Meeting	Weeks, Casey	Siemens Energy, Inc.	Member
62	C37.010 HVCB Applications Guide WG Meeting	Weisker, Jan	Siemens Energy	Member
63	C37.010 HVCB Applications Guide WG Meeting	Westerdale, Matt	Bureau of Reclamation	Member
64	C37.010 HVCB Applications Guide WG Meeting	Woodyard, Terry	Siemens Industry, Inc.	Guest
65	C37.010 HVCB Applications Guide WG Meeting	Young, Marcus	Mitsubishi Electric Power Products, Inc.	Member
66	C37.010 HVCB Applications Guide WG Meeting	York, Richard	Mitsubishi Electric Power Products, Inc.	Guest
67	C37.010 HVCB Applications Guide WG Meeting	ZEE, THEODORE	Eaton Corporation	Guest
68	C37.010 HVCB Applications Guide WG Meeting	Ordein, Fernando	Dominion Energy	Guest
69	C37.010 HVCB Applications Guide WG Meeting	Caverly, David	Trench Ltd.	Excused
70	C37.010 HVCB Applications Guide WG Meeting	Zaharko, Samuel	MEPPI	Excused

Minutes of Meeting

Working Group C37.010 – Application Guide for AC High-Voltage Circuit Breakers > 1000 VAC Rated on a Symmetrical Basis

Location: Catamaran Resort (San Diego CA)
Date: Thursday October 12, 2023 (8:00-9:45AM PST)
Quorum: Membership Count: **41** Members Present: **21**

Agenda

Andy Keels w/ kEElectric Engineering, LLC called the meeting to order and presented the agenda.

Introduction of Members and Guests

TBD Total in Attendance (**21** Members, **TBD** Guests) – Quorum Achieved

IEEE Copyright Policy and Call for Patents

Patent and copyright policy presented. No Patent claims identified.

Dan Benedict (PPL): Questions about Table 6 & Table 7

- See minutes slides
- Neil McCord commented:
 - o Look at test reports to verify if circuit breaker was tested to the design limits. If margin exists, then calculation of overload current curves can be conducted.
 - o It happens more in the larger breakers where the mass is more of a factor, then perhaps the calculation is not as accurate.
- Discussion: Dan Schiffbauer want to assist Dan Benedict with calculation verification
- Motion: Arben Bufi made the motion to accept Dan Benedicts changes to Tables 6 and 7.
2nd to the Motion: Carl Schuetz
Vote: Approved without objection/abstention
- Dan Benedict will report on progress in the Spring 24 meeting.

Carl Schuetz conclusions from Sub-Group Update User-Specified 110% System Nominal Voltage Duty were presented by Andy Keels

- See slides in Meeting Minutes
- John Webb and Carl Schuetz has a discussion that noted there was concern the slides are not clear about what is the intention of operating at 5% above the current allowable rating values
- Proposals for consideration #1 and #2 were reviewed
 - Dan Schiffbauer commented that “All the type tests are based on the rated maximum voltage...” and that the explanations and wording “The standard vales....” on slide discussing Section 4.2 are assumptions. Assumptions should not be permitted in the standard.
- After further discussion the Chair asks subgroup to provide further language to Section 4.2 to provide further guidance to the reader
- Carl Schuetz asked to be part of the subgroup for 110% subgroup. Current members include:
 - o Jan Weisker
 - o Any Chovanec
 - o Dan Schiffbauer
 - o Arben Bufi
 - o Craig Polchinski

- Luke Collette
- Marcus Young
- Chair asked Victor Hermisillo to provide comments for a proposal on guidance in the Section titled “Discuss use of HV side circuit breaker as the device for synchronizing the generator.”
- Additional members were solicited to support Victor in a subgroup creating his proposal.
Current members include:
 - Victor Hermisillo
 - Jan Weisker
 - Andy Chovanec
 - Dave Mitchell
- Pat Dilillo volunteered to provide language on the subject of time periods allowed when in an overvoltage state/condition.
- Luke Collette presented Inverter based resources response during short circuit conditions and asked the question of “what is in C37.010 for short circuit calcs to provide guidance if system have high penetration of IBR?”
 - See meeting slides

Schedule

Next Virtual Meeting: January 17th 2024, 11:00 EST

Next in-person meeting: March 31st – April 4th, 2024 at the Westin Fort Lauderdale, Florida

Agenda was complete

Chair adjourned meeting at 9:45 (PST) on 10/12/2032.

Reported by:

Jeremy Hensberger & Andy Keels

IEEE PES Switchgear Committee C37.010 Workgroup October 12, 2023 In-Person Meeting Attendance

Count	Breakout	Name	Affiliation	Status
1	C37.010 HVCB Applications Guide WG Meeting	Benedict, Dan	PPL Corporation	Member
2	C37.010 HVCB Applications Guide WG Meeting	Bufi, Arben	Meiden America Switchgear	Member
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16	C37.010 HVCB Applications Guide WG Meeting	Schiffbauer, Dan	Toshiba	Member
17	C37.010 HVCB Applications Guide WG Meeting	Schuetz, Carl	American Transmission Company	Member
18	C37.010 HVCB Applications Guide WG Meeting	Smith, R Kirkland	IEEE member / Self Employed	Member
19	C37.010 HVCB Applications Guide WG Meeting	Ward, Jeffrey	Doble Engineering Company	Member
20	C37.010 HVCB Applications Guide WG Meeting	Weisker, Jan	Siemens Energy	Member
21	C37.010 HVCB Applications Guide WG Meeting	Young, Marcus	Mitsubishi Electric Power Products, Inc.	Member