Minutes of Meeting
High Voltage Circuit Breaker Subcommittee

Microsoft Teams
Thursday, June 27 from 16:00 to 17:00 EDT

The HVCB chair called the meeting to order at 16:00 EDT.

Attendees were asked to enter their name and affiliation into the chat.
28 participants in attendance
27 of 57 voting members present – **quorum OK (27/53)**.
Excused HVCB voting members: N. McCord, J. Weisker, S. Chen, W. Zhang

The HVCB chair reviewed IEEE patent slides and asked for participants to report any essential patent claims – none reported.
The HVCB chair reviewed IEEE copyright slides and asked participants to report any need for copyright permissions – none reported.

The HVCB chair reviewed the agenda for the meeting which included review of three draft PARs and consider these PARs for submission to NESCOM. The motivation for this work is to re-establish ANSI accreditation of these documents.
All three PAR study group chairs have volunteered to be the working group chairs.
C37.06.1 – Dan Schiffbauer
C37.017 – Devki Sharma
C37.10.1 – Dave Mitchell
A member asked how the revision process will ensure that ANSI accreditation is obtained. The HVCB secretary replied that the intent for ANSI accreditation is indicated by checking a box in the draft PAR. Then after REVCOM approval, and in parallel with IEEE final editing, the document is submitted to ANSI for accreditation.

The HVCB chair paused the HVCB meeting and asked for the chairs of the C37.06.1, C37.017 and C37.10.1 PAR study groups to hold meetings to review their draft PARs.

> The C37.06.1 PAR study group chair reviewed the scope, purpose and need for the PAR (attached) and asked for a motion to present the draft PAR to HVCB.
> Motion: L. Falkingham
> Second: T. Woodyard
> Discussion: None
> The motion was approved by unanimous consent.
>
> The C37.017 PAR study group chair reviewed the scope, purpose and need for the PAR (attached) and asked for a motion to present the draft PAR to HVCB.
> Motion: J. Webb
> Second: M. Crawford
> Pre-vote discussion: None
> The motion was approved by unanimous consent.
> Post-vote discussion:

PAR study group chair: The intent is to make no changes to the body of the document and go directly to ballot. However, there is concern about the possibility of many editorial comments that could take time to resolve. Also, this is a dual-sponsored document between Switchgear and Substation – participation at Substation committee meetings is not possible for the working group chair.
HVCB chair: The process must be followed. This means formation of a working group, balloting and comment resolution. Resources will be allocated as required. Dual members of the Switchgear and Substation committees offered to support when needed.

The C37.10.1 PAR study group chair reviewed the scope, purpose and need for the PAR (attached) and asked for a motion to present the draft PAR to HVCB.
Motion: G. Becker
Second: J. Cunningham
Discussion: None
The motion was approved by unanimous consent.

The PAR study group meeting was concluded and the HVCB chair resumed the subcommittee meeting.

The C37.06.1 PAR study group chair briefly reviewed the outcome of the study group meeting and requested that the subcommittee approve submission of the draft PAR to NESCOM.
The HVCB chair asked for a motion to submit the draft PAR as presented to NESCOM.
Motion: L. Falkingham
Second: J. Webb
Discussion: None
The motion was approved by unanimous consent.

The C37.017 PAR study group chair briefly reviewed the outcome of the study group meeting and requested that the subcommittee approve submission of the draft PAR to NESCOM.
The HVCB chair asked for a motion to submit the draft PAR as presented to NESCOM.
Motion: D. Mitchell
Second: K. Smith
Discussion: None
The motion was approved by unanimous consent.

The C37.10.1 PAR study group chair briefly reviewed the outcome of the study group meeting and requested that the subcommittee approve submission of the draft PAR to NESCOM.
The HVCB chair asked for a motion to submit the draft PAR as presented to NESCOM.
Motion: D. Schiffbauer
Second: G. Becker
Discussion: None
The motion was approved by unanimous consent.

HVCB chair: Next steps are to submit the PAR to NESCOM and, if approved, form a working group.

With the agenda completed, the chair adjourned the meeting.

Voting Member Attendance:

Family	Given	Affiliation	Attendance
Alexander	Roy	RWA Engineering	
Aristizabal	Mauricio	Hitachi Energy	X
Ashtekar	Koustubh	S&C Electric	
Becker	George	Power Engineers	X
Bufi	Arben	Meiden America Switchgear, Inc.	X
Cary	Stephen	2-phase solutions	
Caverly	David	Trench Ltd.	X
Chen	Steven	Eaton	EA
Chovanec	Andrew	Power Grid Components	X
Christian	Michael	ABB	X
Collette	Lucas	Duquesne Power & Light	X
Crawford	Michael	MEPPI	X
Cunningham	Jason	Southern States	X
Di Lillo	Patrick	Consolidated Edison	
Di Michele	Federico	KEMA	
Door	Jeffrey	The H-J Family of Companies	
Falkingham	Leslie	Vacuum Interrupters Limited	X
Flores	Sergio	Schneider Electric	
Hensberger	Jeremy	MEPPI	
Hermosillo	Victor	GE Vernova	X
Hu	Jingxuan (Joanne)	RBJ Engineering	
Hunter	Jennifer	MEPPI	
Irwin	Todd	GE Vernova	X
Jarnigan	Christopher	Southern Company	X
Johnson	David	HVCB	X
Keels	Thomas (Andy)	Clearway Energy	
Leccia	Brad	Eaton	
Liu	Hua Ying	Southern California Edison	X
Livshitz	Albert	Qualus Services	
Lopez	Adrian	Powell Industries	
Marshall	Vincent	Southern Company	X
May	Steven	Southern Company	
McCord	Neil	KEC Precision	EA
Mitchell	Dave	Southern States	X
Nelson	Jeffrey	TVA	
Palazzo	Mirko	Hitachi Energy	
Polchinski	Craig	MEPPI	X
Ricciuti	Anthony	Eaton	
Santos	Leonel	Schneider Electric	
Schiffbauer	Daniel	Toshiba International Corporation	X
Schuetz	Carl	ATC	X

Family	Given	Affiliation	Attendance
Scott	Jeff	Ameren	
Sharma	Devki	Self	X
Skidmore	Michael	AEP	
Smith	Robert (Kirk)	Retired	X
Steigerwalt	Don	Duke Energy	
Toups	Vernon	Siemens Energy	
Trichon	Francois	Schneider Electric	
Ward	Jeffrey	Doble Engineering	
Webb	John	ABB	X
Weeks	Casey	Siemens Energy	
Weisker	Jan	Siemens Energy	EA
Westerdale	Matt	US Bureau of Reclamation	X
Woodyard	Terrance	Siemens Industry	X
York	Richard	MEPPI	X
Young	Marcus	MEPPI	X
Zhang	Wei	Southern Company	EA

NOTE – EA (Excused Absence) does not count against continued membership and does not count toward meeting quorum.

Attachments:

HVCB Meeting Agenda:

1) **Introduction of Members and Guests**

2) **IEEE Slides**
- Patent slides
- Copyright policy

Quorum Check – 57 voting members, 4 excused, need 27

3) **Meeting Attendance**

Excused members: N. McCord, J. Weisker, S. Chen, W. Zhang

4) **New Business**

a) ANSI accreditation and PAR Study Group Sessions

HVCB:

FYI - SC chair already formed PAR study groups (PSG) and assigned PAR study group chairs – DONE.

PAR Study Groups:

PAR study group chair reviews the proposal and draft PAR,

Steer discussion among PSG members and ask for motion to continue the PAR process at the subcommittee level (take the PAR to the subcommittee).

i) C37.06.1 – chair: Dan Schiffbauer

ii) C37.017 – chair: Devki Sharma

iii) C37.10.1 – chair: Dave Mitchell

HVCB:

Report from PAR study group C37.06.1, motion to submit draft PAR to NESCOM (2/3)

Report from PAR study group C37.017

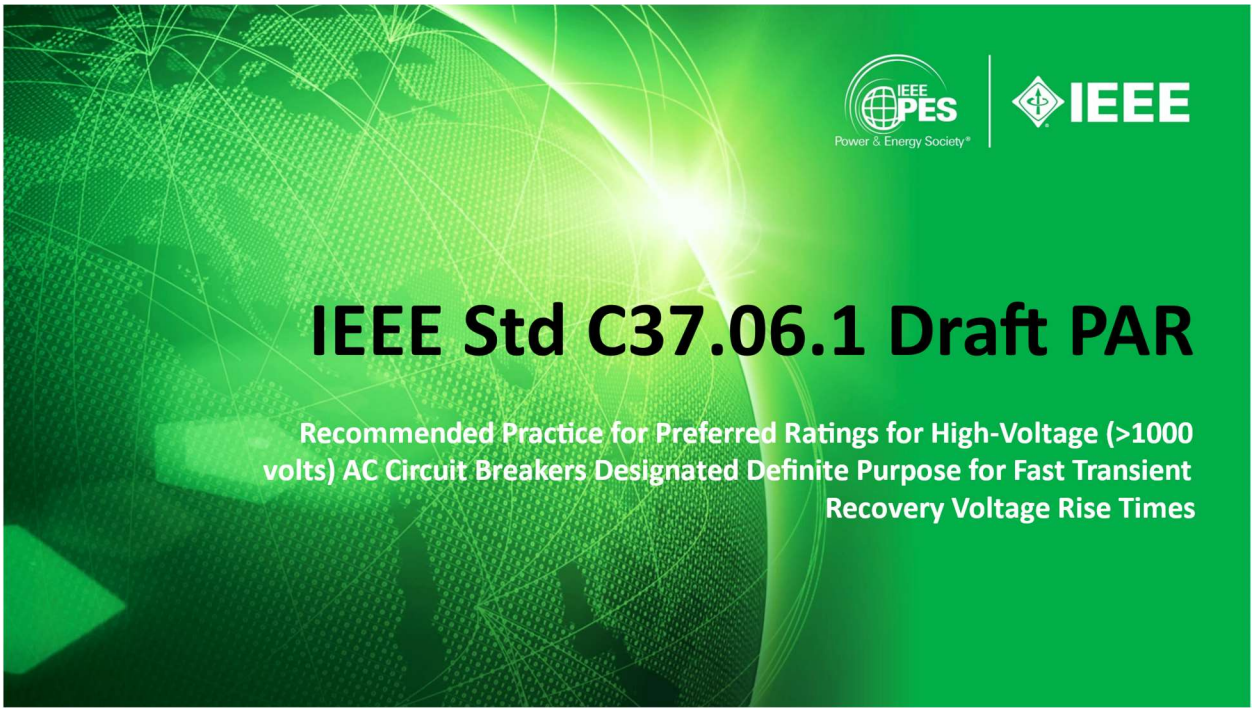
Report from PAR study group C37.10.1

HVCB Subcommittee Agenda, 06/27/2024, 4:00-5:00 EDT, MS Teams

5) **Adjourn**

If needed,
Motion:
Second:

C37.06.1 PAR study group presentation:



Scope

2017 Scope:

This recommended practice is issued as a supplement to IEEE Std C37.06 for high-voltage circuit breaker applications where the transient recovery voltage (TRV) peak is higher and/or its rise to the crest value occurs more rapidly than those specified in IEEE Std C37.06.

2024 Scope:

This recommended practice is issued as a supplement to IEEE Std C37.04 for high-voltage circuit breaker applications where the transient recovery voltage (TRV) peak is higher and/or its rise to the crest value occurs more rapidly than those specified in IEEE Std C37.04.

Purpose

2017 Purpose:
The purpose of this document is to introduce transformer-limited faults, similar to that established by IEEE Std C37.016 [B5], and specifically to provide preferred values for standard ratings of fast transient referred to as transformer-limited fault recovery voltage rise times and to introduce a transformer-limited fault (TLF) breaking current.

2024 Purpose:
The purpose of this document is to introduce the transformer-limited fault (TLF) rating. Specifically, the document provides preferred values for the TLF breaking current and transient recovery voltage parameters.

Need

The revised standard provides users with an updated document that is accredited by the American National Standards Institute.

C37.017 PAR study group presentation:

IEEE SA STANDARDS ASSOCIATION

IEEE

PC37.017

Type of Project: Revision to IEEE Standard C37.017-2020
Project Request Type: Initiation / Revision
PAR Request Date:
PAR Approval Date:
PAR Expiration Date:
PAR Status: Draft
Root Project: C37.017-2020

1.1 Project Number: PC37.017
1.2 Type of Document: Standard
1.3 Life Cycle: Full Use

2.1 Project Title: Standard for Bushings for High-Voltage (Over 1000 Vac) Circuit Breakers and Gas-Insulated Switchgear
Change to Title: ~~IEEE~~ Standard for Bushings for High-Voltage (Over 1000 Vac) Circuit Breakers and Gas-Insulated Switchgear

3.1 Working Group: C37.017 - Standard for Bushings for High-Voltage (Over 1000 Vac) Circuit Breakers and Gas-Insulated Switchgear(PE/SWG/HVCB/C37.017)
3.1.1 Contact Information for Working Group Chair:
Name: Devki Sharma
Email Address: devkisharma@ieee.org
3.1.2 Contact Information for Working Group Vice Chair:
None
3.2 Society and Committee: IEEE Power and Energy Society/Switchgear(PE/SWG)
3.2.1 Contact Information for Standards Committee Chair:
Name: Douglas J Edwards
Email Address: doug.edwards@ieee.org
3.2.2 Contact Information for Standards Committee Vice Chair:
Name: Donald Swing
Email Address: d.swing@ieee.org
3.2.3 Contact Information for Standards Representative:
Name: Keith Flowers
Email Address: keith.flowers@ieee.org
3.3 Co-Stds Committee(s):
3.3.1 IEEE Power and Energy Society/Substations Committee (PE/SUB)
Contact Information for Standards Representative:
Name: Brian Herrmann
Email Address: brian.herrmann@live.com

4.1 Type of Ballot: Individual
4.2 Expected Date of submission of draft to the IEEE SA for Initial Standards Committee Ballot: Oct 2024
4.3 Projected Completion Date for Submittal to RevCom: Dec 2025

5.1 Approximate number of people expected to be actively involved in the development of this project: 37
5.2 Scope of proposed standard: This standard is applicable to bushings intended for use in high-voltage circuit breakers and gas-insulated switchgear. These bushings are intended for indoor and outdoor use, operating on alternating current with a rated voltage greater than 1000 V and a frequency of 50 Hz or 60 Hz. These bushings are usually a part of an apparatus and tested according to the apparatus of which they form part. Insulators or bushings used as an element of metal-enclosed switchgear assemblies, or in reclosers, sectionalizers, or similar equipment, are not included in the scope of this document. This standard does not apply to the following: a) High-voltage cable terminations b) Bushings for instrument transformers c) Bushings for test transformers d) Bushings for power transformers e) Bushings for oil-filled circuit breakers f) Oil-filled bushings in general

5.3 Is the completion of this standard contingent upon the completion of another standard? No
5.4 Purpose: This standard defines the special terms used, service conditions, ratings, general requirements, test

procedures, and acceptance criteria for these bushings.

5.5 Need for the Project: There is a need in the North American market for a national standard on bushings for use with high voltage circuit breakers, and gas insulated switchgear. In the past IEEE standard C57.19.00 applied to all bushings for power apparatus including oil-filled circuit breakers, reactors, transformers etc,. Standard C57.19.00 has since been revised and it now applies to oil-filled transformers and reactors only. The current IEEE standard on circuit breakers, and switchgear do not cover the subject of bushings adequately. This proposed standard is intended to rectify the deficiency.

5.6 Stakeholders for the Standard: Manufacturers, Utilities

6.1 Intellectual Property

6.1.1 Is the Standards Committee aware of any copyright permissions needed for this project?
No

6.1.2 Is the Standards Committee aware of possible registration activity related to this project?
No

7.1 Are there other standards or projects with a similar scope? Yes

Explanation: IEC standard 60137 is some what similar in scope. It is used for references and as a guide

7.1.1 Standards Committee Organization: IEC

Project/Standard Number: 60137

Project/Standard Date:

Project/Standard Title: Insulated bushings for alternating voltages above 1000 V

7.2 Is it the intent to develop this document jointly with another organization? No

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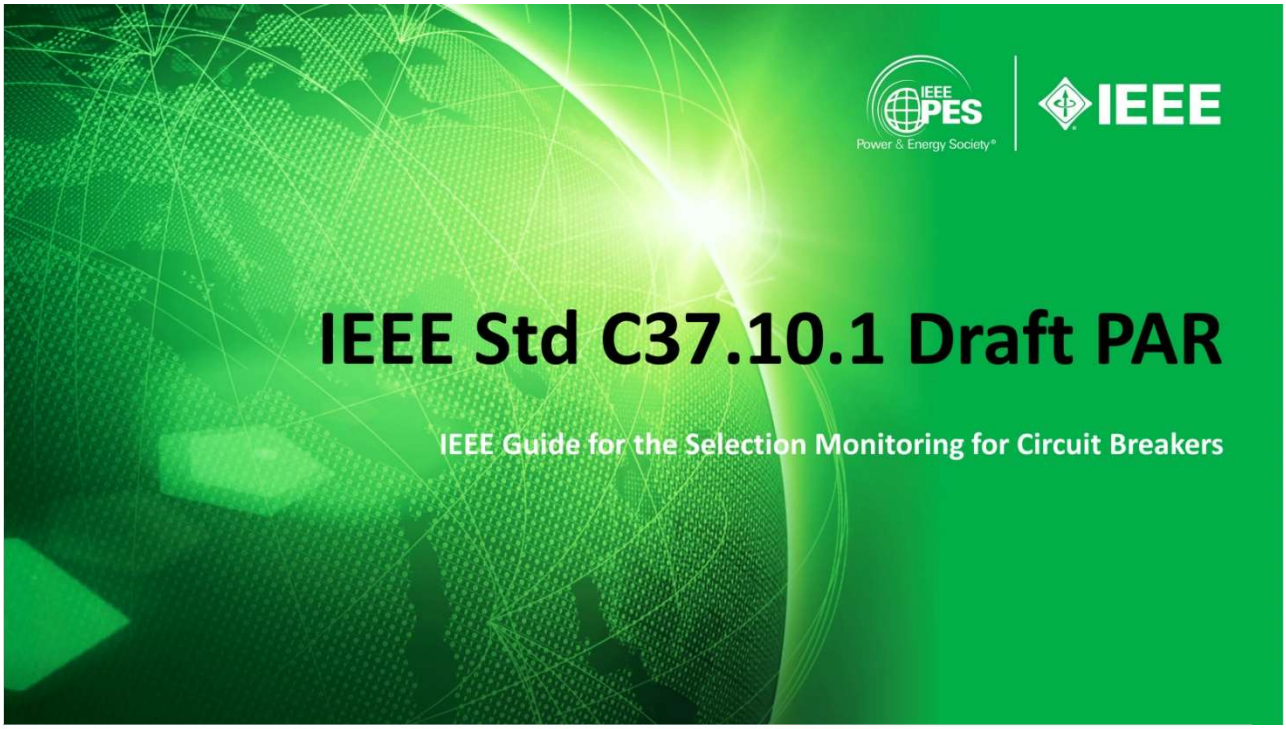
8.1 Additional Explanatory Notes:

C37.10.1 PAR study group presentation:



Scope

This guide provides direction for the selection of monitoring and for diagnostic parameters to be used with high-voltage circuit breakers (i.e., above 1000 V ac). It provides guidance on appropriate parameters to be considered for monitoring applied to various circuit breaker technologies.

This guide will lead a user through an analysis of circuit breaker performance and application expectations. The analysis includes a failure modes and effects analysis (FMEA) of the circuit breaker and associated components, an analysis of the risks associated with failure of the specific application, and a discussion of the items to be considered in a costbenefit study to justify application of monitoring in its many forms. Monitoring is dependent on the technology of the circuit breaker and monitoring available at the time of application. FMEA, as well as failure modes, effects, and criticality analysis (FMECA), are methods of reliability analysis intended to identify failures that have significant consequences affecting the system performance in the considered application.

NOTE—The examples shown are for illustrative purposes only. Numeric and financial values shown are solely for the purpose of showing that values can be assigned if so chosen. Actual circumstances will dictate values, costs, and expenses to be used in the quantifying of risk, economic evaluation and justification, and the ultimate selection of monitoring. The specific circuit breaker technology employed will also either restrict or broaden opportunities for monitoring.1

This guide provides advice on what parameters can be monitored to derive information about the condition of a circuit breaker. Use of techniques, such as those in CEA Project No. 485T1049 (1997), provides more information on combining appropriate signals to derive greater information than either signal alone would provide.2

Circuits associated with the operation of the circuit breaker, which might include auxiliary contacts, X and Y relays, lockout switches, and so on, are included in this guide. External control circuits are not included in the scope of this guide. This guide is not intended to provide guidance on the monitoring of protection and control circuits, although they can have a significant effect on the overall circuit breaker functions.

Need

The revised standard provides users with an updated document that is accredited by the American National Standards Institute.

IEEE SA STANDARDS ASSOCIATION

IEEE

PC37.10.1

Type of Project: Revision to IEEE Standard C37.10.1-2018
Project Request Type: Initiation / Revision
PAR Request Date:
PAR Approval Date:
PAR Expiration Date:
PAR Status: Draft
Root Project: C37.10.1-2018

1.1 Project Number: PC37.10.1
1.2 Type of Document: Guide
1.3 Life Cycle: Full Use

2.1 Project Title: Guide for the Selection of Monitoring for Circuit Breakers
Change to Title: ~~IEEE~~ Guide for the Selection of Monitoring for Circuit Breakers

3.1 Working Group: C37.10.1 - Guide for the Selection of Monitoring for Circuit Breakers(PE/SWG/HVCB/C37.10.1)
3.1.1 Contact Information for Working Group Chair:
Name: David Mitchell
Email Address: david.k.mitchell@ieee.org
3.1.2 Contact Information for Working Group Vice Chair:
None
3.2 Society and Committee: IEEE Power and Energy Society/Switchgear(PE/SWG)
3.2.1 Contact Information for Standards Committee Chair:
Name: Douglas J Edwards
Email Address: doug.edwards@ieee.org
3.2.2 Contact Information for Standards Committee Vice Chair:
Name: Donald Swing
Email Address: d.swing@ieee.org
3.2.3 Contact Information for Standards Representative:
Name: Keith Flowers
Email Address: keith.flowers@ieee.org

4.1 Type of Ballot: Individual
4.2 Expected Date of submission of draft to the IEEE SA for Initial Standards Committee Ballot: Jul 2024
4.3 Projected Completion Date for Submittal to RevCom: Jan 2025

5.1 Approximate number of people expected to be actively involved in the development of this project: 12
5.2 Scope of proposed standard: This guide provides direction for the selection of monitoring and for diagnostic parameters to be used with high-voltage circuit breakers (i.e., above 1000 V ac). It provides guidance on appropriate parameters to be considered for monitoring applied to various circuit breaker technologies. This guide will lead a user through an analysis of circuit breaker performance and application expectations. The analysis includes a failure modes and effects analysis (FMEA) of the circuit breaker and associated components, an analysis of the risks associated with failure of the specific application, and a discussion of the items to be considered in a cost-benefit study to justify application of monitoring in its many forms. Monitoring is dependent on the technology of the circuit breaker and monitoring available at the time of application. FMEA, as well as failure modes, effects, and criticality analysis (FMECA), are methods of reliability analysis intended to identify failures that have significant consequences affecting the system performance in the considered application. NOTE--The examples shown are for illustrative purposes only. Numeric and financial values shown are solely for the purpose of showing that values can be assigned if so chosen. Actual circumstances will dictate values, costs, and expenses to be used in the quantifying of risk, economic evaluation and justification, and the ultimate selection of monitoring. The specific circuit breaker technology employed will also either restrict or broaden opportunities for monitoring. This guide provides advice on what parameters can be monitored to derive information about the condition of a circuit breaker. Use of techniques, such as those in CEA Project No. 485T1049 (1997), provides more information on combining appropriate signals to derive greater information than either signal alone would provide. Circuits associated with the operation of the circuit breaker, which might include

auxiliary contacts, X and Y relays, lockout switches, and so on, are included in this guide. External control circuits are not included in the scope of this guide. This guide is not intended to provide guidance on the monitoring of protection and control circuits, although they can have a significant effect on the overall circuit breaker functions.

5.3 Is the completion of this standard contingent upon the completion of another standard? No
5.4 Purpose: This document will not include a purpose clause.
5.5 Need for the Project: The revised standard provides users with an updated document that is accredited by the American National Standards Institute.
Change to Need for the Project: ~~Revise~~ The revised standard ~~to~~ provides ~~reflect~~ users ~~current~~ with ~~methods~~ an ~~of~~ updated ~~monitoring~~ document ~~power~~ that is accredited by the ~~circuit~~ American ~~breakers~~ National Standards Institute .
5.6 Stakeholders for the Standard: Circuit breaker suppliers and users.

6.1 Intellectual Property

6.1.1 Is the Standards Committee aware of any copyright permissions needed for this project?
No

6.1.2 Is the Standards Committee aware of possible registration activity related to this project?
No

7.1 Are there other standards or projects with a similar scope? No
7.2 Is it the intent to develop this document jointly with another organization? No

8.1 Additional Explanatory Notes: