

C37.59 Working Group
MINUTES OF THE Spring 2015 MEETING

Tradewinds, St. Pete Beach, FL USA
2:00 – 6:00PM, April 28, 2015

April 28: The meeting was called to order by Chair, M. Dean Sigmon at 2:00 PM.

Attendance

Quorum: 28 total members thus Quorum required 14 members.

Members: 24 members were present, thus quorum was met for meeting.

19 Guest participated for total of 43 present.

Attendance is listed at bottom of this document. Membership and attendance status are updated in AMS system.

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1. Introductions and attendance
Introduction of attendees and attendance roster distributed.
2. Approval of Meeting Agenda
Agenda was discussed and approved by consensus.

Agenda was shown, discussed, and approved.
Motion by Allan Morse to approve agenda as shown.
2nd by Larry Yonce
Approved unanimously
3. Approval of Fall 2014, Asheville, NC minutes
Minutes was shown, discussed, and approved.
Motion by Ted Burse to approve minutes as shown.
2nd by Marcelo Valdes
Approved unanimously
<http://www.ewh.ieee.org/soc/pes/switchgear/minutes/2014-2/F14ADSCOMa6.pdf>
4. Standard Status
 - a. PAR expires December 31, 2018.
5. Reports from Task Groups formed at Spring, 2014 meeting:
 - a. Definite Purpose Switching Larry Yonce
Is it appropriate to call them MV DPS? Are any updates to be made to C37.59?
Discussion: Calling Fused Contactors used to replace "medium-voltage" circuit breakers a "medium-voltage definite purpose switching device (MV DPS)" leads people to believe there is a standard, especially as there is a low-voltage definite purpose switching devices (LV DPS).
Are there MV DPS being built? Yes.
D. Sigmon reported that HVCB does not have interest in creating a standard for this type product.
C37.20.10 has been updated to have definition as Low-Voltage Definite Purpose Switching device (LV-DPS).
As C37.59 is a "process" document, a standard covering the product (MV-DPS or HV-DPS) would be appropriate before any comments from C37.59 were detailed. However, discussion was that C37.59 can address equipment for which there is not a product standard, i.e. details concerning the conversion process for such equipment could be addressed.
There is confusion by changing from term "Fused Contactor" conversion to DPS. One major issue is with Open Contacts dielectric isolation.

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Motion: Ted Burse: Return text to language in C37.59-2007 AC Fused Contactors. 2nd: Paul Barnhart. Unanimously approved

Action Item (AI): Make update to next draft.

- b. Medium Voltage: Cassette Adapters J. Webb (not present), Reported by D. Sigmon
- i) Section 6.6: There are LV cassette adaptors being inserted and then a standard CB can be inserted. The concepts have extended to MV devices in the field.
P. Barnhart: Do not like “device” instead of CB.
Motion: Title and text – change from Device to CB. 2nd: T. Burse. Unanimously passed
- ii) Fixed Mount issue: Retrofill addresses.
A Livshitz: Why racking is in-operable? Suggest needs “word smithing” to detail interlocking is required.
M. Lafond: Why 6.6 g)? Suggest that process does not need to be limited to MV.
Propose: Add bullet for LV. Maybe consider MV Metal-Enclosed.
- iii) A Livthitz: Section 6.6 g) MOC & TOC issues?
AI: Review text for MOC & TOC wiring.
AI: Review moving to Retrofill section of document.
- iv) Section 6.6 e) Updated
- v) Review adding C37.20.3 through-out.
- c. Low Voltage: DC conversions R. Rohr
R. Rohr: Has shared with Transit folks to make aware of C37.59 document and request their input.
D. Sigmon: Section 6.7 has been added. Is this in or out of Scope?
P. Barnhart: More than just SC Current issues for Energy Storage systems.
AI: DC Conversions TF to continue to provide updates.
- d. Low Voltage: MCCB in Switchgear Assemblies J. Webb (not present), Reported by D. Sigmon
No discussion.
- e. Annex: Conversion Documentation Forms T. Esco
C37.59 Annex Forms (2015-04-23) presented.
Updated form shown.
AI: Add Location Identification blanks.
AI: Add placeholder for IEEE URL for the form. D. Edwards to coordinate with IEEE Editors to get URL and provide to T. Esco to add.
A URL of this form will be in the electronic copy of the published version of C37.59 for those who purchase C37.59. According to Erin Spiewak, individuals would also be able to go to the IEEE SA website to download a copy of this live form, at no charge. Those individuals, however, would not be able to get a copy of C37.59 free of charge.
- f. Switchgear Assemblies: Racking Endurance L. Yonce

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Should racking endurance be increased to more current 500 racking operations?

WG discussed that capabilities of the original equipment is not modified by the addition of a new CB.

6. Discuss the need for active Task Groups for the following topics:

- a. Medium Voltage: 2-High Switchgear TF: No Chair/Group, Reported by D. Sigmon

Future target is to review watts loss issues.

T. Burse: No issue.

Motion by T. Burse: The requirements for 2-High Switchgear are fully covered and no further actions are required. 2nd by M. Valdes. Unanimously approved.

- b. Medium Voltage: Capacitor Switching TF: L. Yonce

If you are going to add adding Capacitor Switching CB's to existing switchgear.

Motion by Bob Kohn: The requirements for use of Capacitor Switching CB's to existing switchgear are fully covered and no further actions are required. 2nd Amit Patel, Unanimously approved.

- c. Low Voltage: Adapter in Cassette J. Webb (not present), Reported by D. Sigmon

No comments have been received.

Motion by Allan Morse: The requirements for LV Adaptors in Cassette are fully covered and no further actions are required. 2nd by T. Burse. Unanimously approved.

- d. Switchgear Assemblies: Arc Resistant (AR) conversions TF: Doug Edwards

There is no need for any changes to the Standard. All issues are addressed in current standard.

Introduction: States standard addresses clarifications needed for Arc-Resistant performance.

6.2.1 e): AR conversions to non-AR switchgear require design verification to substantiate performance.

6.2.1 f): Conversion to AR switchgear required design verification of modifications.

6.4 Conversion of switchgear to arc-resistant – Requires internal arcing tests per C37.20.7.

6.5 Modifications of arc-resistant switchgear – Requires design verification that AR performance is not degraded.

There was discussion related to the version of IEEE Std C37.20.7 that would apply when a converter is converting conventional switchgear to arc resistant. There was consensus, that just like conversions of other switchgear devices, the converter should refer to the version of C37.20.7 applicable at the time of original equipment manufacturer.

Motion by D. Edwards: The requirements for Arc Resistant (AR) conversions are fully covered and no further actions are required. 2nd by T. Burse. Unanimously approved.

7. Review of C37.59-D4 and C37.59 XXXX creating draft D4.15 to lead discussions. D. Sigmon

- a. General: Dated References

1. Dated References

Comment received detailing update of Draft 3 for removal of dated reference.

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2. C37.06 and C37.16

Per recommendation from Fall 2015 (Asheville), footnotes added:

⁴ As this draft goes to press, the information in IEEE C37.16 is in the process of being incorporated into IEEE Standard C37.13 (for LV ac circuit breakers) or IEEE Std C37.14 (for dc circuit breakers). Upon approval of IEEE C37.13 and/or IEEE C37.14, all references to IEEE C37.16 in this document shall be interpreted as referring to IEEE C37.13 or IEEE C37.14, as applicable.

¹⁵ As this draft goes to press, the information in IEEE C37.06 is in the process of being incorporated into IEEE Standard C37.04. Upon approval of IEEE C37.04, all references to IEEE C37.06 in this document shall be interpreted as referring to IEEE C37.04 as applicable.

However, references to C37.06 and C37.16 remain in current draft at will be reviewed for maintaining these references pending withdrawal of C37.06 and C37.16.

8. Issues to be discussed include:

- a. Medium Voltage definite purpose switching devices
- b. Medium Voltage Adapter in Cassette
- c. The future status of IEEE C37.06, IEEE C37.16, and IEEE 62271-37-013
 - i) C37.06 and C37.16

Per recommendation from Fall 2015 (Asheville), footnotes added:

⁴ As this draft goes to press, the information in IEEE C37.16 is in the process of being incorporated into IEEE Standard C37.13 (for LV ac circuit breakers) or IEEE Std C37.14 (for dc circuit breakers). Upon approval of IEEE C37.13 and/or IEEE C37.14, all references to IEEE C37.16 in this document shall be interpreted as referring to IEEE C37.13 or IEEE C37.14, as applicable.

¹⁵ As this draft goes to press, the information in IEEE C37.06 is in the process of being incorporated into IEEE Standard C37.04. Upon approval of IEEE C37.04, all references to IEEE C37.06 in this document shall be interpreted as referring to IEEE C37.04 as applicable.

However, references to C37.06 and C37.16 remain in current draft at this time pending withdrawal of C37.06 and C37.16

Ted Olsen noted that converters would still need to refer to the tables in C37.06 and C37.16 even after they are administratively withdrawn because converters must often use the standards that were applicable at the time the original equipment was manufactured. Erin Spewak indicated that earlier versions of these documents would remain in IEEE xPlore even after current versions are withdrawn.

9. Action Item Summary

- a. New Item discussion (was not in Agenda) – Inspection Windows and Ports T. Rohrer

The draft is presented to address concerns when adding various types of Inspection Windows and Ports.

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Text for both normative portion of the document and text potentially for an Informative Annex are provided (attached to these minutes).

Motion: T. Olsen: Add Inspection Windows and Ports document into next draft both the normative (added to normative section of document) and informative text (added into an informative Annex section of document) for review by WG. 2nd by Allan Morse. Unanimously approved

AI: Make update to next draft.

b. Review of Comments identified by Chair for discussion.

c. Remote racking

Manufacturer states that they have seen issues with a Remote Racking unit damaging circuit breaker or switchgear racking mechanisms. The mechanical racking test with such devices should be considered.

AI: Review UL 2876 - Outline of Investigation for Remote Racking Devices for Switchgear and Controlgear for potential reference.

d. Amit Patel: Section 6.3 Metal-Enclosed Switchgear

Need to add 3 points.

Fuse can be replaced by fixed CB

Switch and fuse and be replaced by fixed CB.

LBS can be replaced by disconnect.

Section 3: Add text to cover Metal-Enclosed text.

10. Adjourn

Motion to adjourn by T. Burse, 2nd by Amit Patel. Unanimously approved. Meeting was adjourned at 5:48 PM.

Reported by:

Doug Edwards

Vice-Chair C37.59

E: doug.edwards@ieee.org

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Attendance

Role	First Name	Last Name	Company
Chair	Dean	Sigmon	Eaton Corporation
Vice-Chair	Doug	Edwards	Siemens Industry, Inc.
Member	Paul	Barnhart	Underwriters Laboratories
Member	Ted	Burse	Powell Industries, Inc
Member	Robert	Cohn	Powercon Corp.
Member	Daniel	Delfino	General Electric
Member	Tanner	Esco	Eaton Corporation
Member	Michael	Flack	Southern Company Generation
Member	Keith	Flowers	Siemens Industry, Inc.
Member	Paul	Grein	Circuit Breaker Sales, Co, Inc, - GroupCBS
Member	Anurag	Jivanani	General Electric
Member	Michael	Lafond	General Electric
Member	David	Lemmerman	PECO/Exelon
Member	Albert	Livshitz	CE Power Solutions
Member	Jeffery	Mizener	Siemens Industry
Member	Charles	Morse	Morse Ventures, Inc.
Member	Darryl	Moser	ABB
Member	Ted	Olsen	Siemens Industry, Inc.
Member	Anthony	Ricciuti	Eaton Corporation
Member	Richard	Rohr	Powell Electrical Systems
Member	Tim	Rohrer	Exiscan
Member	Paul	Sullivan	DuPont
Member	Marcelo	Valdes	GE
Member	Larry	Yonce	Eaton Corporation
Guest	Stephen	Cary	GE Energy Management
Guest	Jason	Cunningham	Hitachi HVB, Inc.
Guest	Patrick	Di Lillo	Consolidated Edison Co. of NY, Inc.
Guest	Bernie	Dwyer	PECO
Guest	Douglas	Giraud	Powell Electrical Systems
Guest	Lou	Grahor	Eaton Corporation
Guest	Ronald	Hartzel	Eaton Corporation
Guest	Jeffrey	Hidaka	Underwriters Laboratories
Guest	Russell	Long	Retired
Guest	Ryan	McClarnon	Utility Relay Company
Guest	Miklos	Orosz	Schneider Electric
Guest	Amit	Patel	GE
Guest	Dave	Riffe	Westinghouse Electric Company
Guest	John	Shullaw	GE Energy Management - Industrial Solutions
Guest	Jon	Spencer	Thomas & Betts Hi-Tech
Guest	Erin	Spiewak	IEEE
Guest	Donald	Swing	Powell Industries
Guest	Dragan	Tabakovic	Hitachi HVB
Guest	Robert	Warren	DNV GL - KEMA Laboratories

Inspection Windows: Proposed text for C37.59 -- Conversion of Power Switchgear

Changes made taking Ted's comments into consideration...

7. Inspection Windows and Ports [Note: current Section 7, 8, 9 and 10 would all be shifted to 8, 9, 10 and 11 respectively]

Any alterations to the enclosure to accommodate a new inspection window or inspection port (including: IR inspection window, visual inspection window or ultrasound port) shall require design verification per relevant IEEE standards for the class of equipment being modified:

- IEEE Std C37.20.1 for LV Metal Enclosed Switchgear
- IEEE Std C37.20.2 for MV/HV Metal Clad Switchgear
- IEEE Std C37.20.3 MV/HV Metal Enclosed Switchgear

Any alterations to the enclosure to accommodate a new inspection window or inspection port should require design verification per relevant UL, NEMA standards for the window/port being installed

- UL 50V for infrared windows
- UL 508/508A for visual windows and ultrasound ports

- A. The integrity of the enclosure with respect to grounding, and access to energized conductors, shall be design verified.
- B. The NEMA/environmental rating (LV equipment) or Enclosure Category (MV/HV equipment) of the original enclosure shall not be degraded relative to the original rating of the enclosure, and shall comply with gasketing requirements in the relevant IEEE standard.
- C. The window optic shall be impact resistant in accordance with the requirements for "viewing panes" in the relevant IEEE standard.
- D. All parts of the frame, gasketing and optic should be Flame Resistance, where applicable, in accordance with "polymeric materials" in relevant UL standards.
- E. The general structural integrity and mounting of the window frame and cover (if applicable) shall be in accordance with the "enclosure requirements" of the relevant IEEE standard.
- F. Alterations to arc resistant switchgear shall require design verification to substantiate the performance of the modified equipment during internal arcing tests in accordance with IEEE Std C37.20.7.
- G. Manufacturer's instructions for installation shall be followed.

Suggested Informational Annex:

Comment [DJE1]: ???

Comment [DJE2]: ???

With the evolution of electrical safety standards, addition emphasis has been given to performing routine tasks with equipment doors and panels closed and with equipment in normal operating condition. Consequently, inspection windows (including: visual inspection windows, infrared (IR) windows an ultrasound ports) are commonly installed to facilitate closed-panel diagnostics and maintenance protocols.

Installation of an inspection window will require alterations to the enclosure: Typically, one or more penetrations will be made in the enclosure wall, panel or door, and the inspection window will be attached to the enclosure over the spot where the penetration was made. Any alterations to the enclosure to accommodate a new inspection window shall require design verification as detailed in Section 7.# [note: refers to the new section above].

A. Visual Inspection Windows

A visual inspection window is a component consisting of a fixed aperture, covered by a solid, visually transparent media (“optic”), surrounded by a mounting bezel or frame, and may include a cover to protect the optic when not in use.

A visual inspection window is typically installed to allow closed-panel access for workers to (among others):

- View HMIs (Human Machine Interfaces)
- Verify blade position on disconnects, in compliance with regulatory mandates
- Check for evidence of dust, moisture or rodent ingress
- Check for evidence of arcing, corona or tracking
- Check for evidence insulation breakdown
- Check for general deterioration of conductors
- Check for other “house-keeping” concerns

B. Infrared (IR) Windows and Ports

An IR window is a component consisting of a fixed aperture, covered by a solid infrared transmitting media (“optic”) that provides for the passage of infrared radiation, surrounded by a mounting bezel or frame, and includes a cover to protect the optic when not in use. Care should be taken to choose an optic material compatible with the wavelengths detected by the thermal detector(s) to be utilized.

An IR port is a component consisting of a fixed aperture or pattern of holes with no transmitting media, surrounded by a mounting bezel or frame, and includes a cover to protect the opening when not in use.

IR windows and IR ports are typically installed to allow closed-panel infrared scans of electrical conductors, in keeping with various predictive maintenance and preventive maintenance standards and insurance mandates. Typical targets of IR scans are:

- Fuses and fuse clips
- Molded case circuit breakers
- Cables and cable terminations
- Bus connections
- Bus bar that leads to directly to breaker stabs

- **Other electrical terminations**

C. Ultrasound Ports

An ultrasound port is a component consisting of a fixed aperture, surrounded by a mounting bezel or frame, and includes a cover to protect the opening when not in use.

Ultrasound ports are typically installed to allow closed-panel ultrasound scans of electrical conductors, in keeping with various predictive maintenance and preventive maintenance standards. Ultrasound scans can identify arcing, corona and tracking issues. Many facilities use ultrasound, not only for maintenance diagnostics, but also to identify these issues prior to opening equipment to identify potentially dangerous situations prior to opening electrical equipment.