



**POWER SYSTEM RELAYING AND CONTROL COMMITTEE  
of the IEEE POWER AND ENERGY SOCIETY  
MINUTES of the MEETING in Buffalo, New York, USA**

**May 13-16, 2024, In-Person Meeting held at Hyatt Regency Buffalo Hotel and Conference Center, Buffalo, NY, USA**

**I. Call to order / Introductions and Chair's Report: Michael Thompson**

Chair Michael Thompson, called the Main Committee meeting to order at 7:32 AM (EDT) on Thursday, May 16, 2024.

Following tradition, attendees introduced themselves. First time attendees reintroduced themselves and were recognized.

A quorum check was conducted and verified that quorum was achieved. As of January 1, 2024, there are 121 Main Committee Voting Members. PSRC Rules require 50% attendance for quorum for groups larger than 50, so 61 Voting Members constitute quorum. Manual count indicated there were 61 Main Committee Voting Members present, so quorum was achieved; additional Voting Members joined after the quorum check for total of 66 Voting Members attending. Attendance at the meeting was recorded via in-person sign-in sheets. Attending this Main Committee meeting were 140 people both. Main Committee Meeting attendance breakdown is summarized in the following table:

Main Committee Meeting Attendance January 11, 2024	Voting Members	Guests	Total*
In person	66	74	140

There were no objections or additions to the previously published meeting agenda. The final (Draft 8) meeting agenda is included in Addendum B of these Minutes.

**Chair's Report - Michael Thompson**

The May 2024 joint PSRC and PSCC committee meeting was held at the Hyatt Regency Buffalo Hotel and Conference Center, in Buffalo, NY. The IEEE PES PSRC Committee meeting was organized as a face-to-face meeting and the PSCC Committee meeting was organized as a hybrid meeting. Many of our participants took the opportunity to visit Niagara Falls and other sights of this historic city.

We are pleased to report that the in-person attendance is continuing on an upward trend. The last two meetings have seen over two hundred attendees. We saw a significant reduction (less

than 20% compared to the previous meeting) in virtual registrations. The break down in participants at this meeting is shown below.

<b>Committee</b>	<b>In person</b>	<b>On line</b>	<b>Total</b>
<b>PSCCC</b>	9	8	17
<b>PSRC</b>	155	2	157
<b>Both</b>	50	6	56
<b>Total</b>	214	16	230

In our efforts to improve the enrichment associated with our in-person meetings, I hope many of you took advantage of the Lunch and Learn, *A Brief Introduction to AI and Machine Learning for Protective Relaying Engineers* presented by Ted Hibka. We hope to use our lunch and learn event in September to present training on the new membership management system, Member Planet. Stay tuned for announcements. I hope that you all continue to do the best you can to manage rosters and communicate to keep the work going until this important system becomes a reality. We thank him for sharing his knowledge on this emerging topic. The awards ceremony and welcome reception was a lot of fun too.

I want to thank our coffee break sponsors, Beckwith Electric, Sargent & Lundy, and S&C Electric Company. We very much appreciate their support. If your company is interested in sponsoring coffee breaks, please reach out to our Secretary, Jim Niemira. He is planning to include a direct link in the registration form to make sponsoring easy.

I want to recognize the loss of one of our significant contributors. Jim Ingleson passed away in 2024. Jim had had a long and distinguished career with GE and the NY Independent System Operator. He led the I subcommittee and was recognized with the Distinguished Service Award in 2007.

I would also like to make everyone aware of the efforts of Cathy Dalton, chair of the B5, Publicity WG, to promote the PSRC and expand awareness of the important work that we do. The B5 WG is looking to increase membership to become more active. Please contact Cathy to join the WG roster. It should be a rewarding experience to help increase the PSRC visibility in social media and in helping grow interest in the important work of the committee. We need more knowledgeable and passionate contributors to keep up with the rapidly evolving power systems. The IEEE PSRC Committee now has a LinkedIn page. I encourage everyone to join to see postings on what is happening in the world of protective relaying.

Thank you to everyone for making our May 2024 meeting a success. I look forward to seeing you all in Scottsdale, AZ for our September meeting.

Sincerely

Michael Thompson

## **II. Approval of Minutes / Financial Report: Jim Niemira**

Draft 1 of Minutes of the January 2024 PSRC hybrid meeting held in conjunction with JTCM 2024 in New Orleans, LA, were posted to the PSRC website for review. A motion to approve the Minutes of the January 2024 meeting as posted was made by Michael Higginson and seconded by Russel Patterson. The Motion to Approve May 2023 Minutes passed unanimously.

Total registration for both PSCCC and PSRC for the May 2024 is 214 in person and 16 on-line participants for total of 230 registrants. This compares to 218 in person and 83 on line in January 2024 at JTCM; 257 in person at the September 2023 meeting; and 260 in person at the May 2023 meeting.

The PSRC committee financial status is healthy. Registration fees for the May 2024 meeting were increased slightly over previous meetings to cover higher costs. PSRC has a goal to run meetings near revenue neutral where fees are reasonable and adequate to cover expenses while maintaining an appropriate operating reserve that will cover emergencies. Future meetings are expected to cost more, so registration fees will be adjusted in accordance with anticipated revenues and expenses.

Many thanks to our meeting sponsors: Sargent & Lundy; Beckwith Electric / Hubbell; and S&C Electric Company.

Many thanks to PSCCC members Jim Formea, Craig Palmer, Jim Bougie, and Eric Thibodeau for help with conference phones and setting up WebEx meetings.

Also thanks to Melania Thompson for assistance staffing the Registration Desk.

### **Future Meeting Plans – Gene Henneberg**

PSRC Committee meets in person only for two of three meetings per year. January meeting at JTCM supports hybrid format. The May and September PSRC meetings are in person only, although individual WGs may support hybrid on their own. We plan to have one meeting room with conference phone setup for use by PSRC Working Groups, as scheduling permits, for the May and September meetings.

PSCC Committee supports hybrid format at all its meetings and plans to have conference room phones in its meeting rooms in January, May, and September.

PSRC meets with the IEEE PES JTCM in January, and the JTCM will support hybrid format for all PSRC meetings similar to the meetings held in January 2022, January 2023, and January 2024.

Future PSRC meetings:

September 9-12, 2024, Scottsdale, AZ, (in person) Embassy Suites by Hilton Scottsdale Resort

January 12-16, 2025, with JTCM, Garden Grove, CA, (hybrid) Hyatt Regency

May 12-15, 2025, Portland, OR, (in person) Hilton Portland Downtown

September 2025 – 2026, no final information yet. We are considering venues across the USA, west, central, and east, for the PSRC meetings.

### **Association Management System Update – Gene Henneberg**

MemberPlanet is ready to test committee structure and email tools.

Next step will input committee structures for three different committees (PSCC, TX, and PSIM).

Not yet ready to send attachments to emails or store documents in the system.

If you haven't created your profile, or if your contact information has changed, please create or update your profile. A profile is required to keep you apprised of PSRC activities and to maintain voting member status on any roster.

<https://ieee.memberplanet.com/v2app#/member-registration/join>

If you are in more than one PES Technical Committee, YOU SHOULD CREATE ONLY ONE MEMBER PROFILE. All PES TC share the database; you will use the same Member Profile for ALL PES TC

**III. Reports of Interest**

**A. Technical Paper Coordinator’s Report: Gene Henneberg**

**IEEE Copyright**

- You may run across posts on LinkedIn or elsewhere that share IEEE standards documents.
- If you see this, please forward information including any links to the post to: [infringement@ieee.org](mailto:infringement@ieee.org) to alert IEEE.
- You can find this link on the Knowledge Base page at the PSRC website [pes-psrc.org](http://pes-psrc.org).

**2024 T&D May 6-9, 2024, Anaheim, CA**

PSRC: one 8-hour tutorial:

Inverter Based Resource (IBR) Short Circuit Modeling  
Evangelos Farantatos (chair), Sukumar Brahma,  
Aboutaleb Haddadi, Sherman Chan, Mohammad Zadeh,  
Yazid Alkraimeen



5 PSRC two-hour panel sessions

Augmenting traditional utility P&C approach with AI/ML for Solving Challenges for the grid of the future – Abder Elandalousi

Wildfire Mitigation for Electrical Power Systems – Jonathan Sykes

Inverter Based Resource (IBRs) Interconnection and Penetration Issues – Jonathan Sykes

Industry Viewpoints on IEC 61850 – Rich Hunt

Improving Protection of Low-Voltage Networks with High DER – Matthew Reno

7 papers reviewed by PSRC, 5 accepted

15 Paper Review Volunteers—THANK YOU!

Abu Bapary	Evangelos Farantatos	Gary Kobet	Russ Patterson
Sebastien Billaut	Gene Henneberg	Hillmon Ladner	Charlie Sufana
Joerg Blumschein	Kevin Jones	Rene Midance	Michael Thompson
Steve Conrad		Adi Mulawarman	Benton Vandiver

Reviewing papers for IEEE Transactions and Conferences is a responsibility of all Main Committee Members.

**2024 IEEE PES GM July 21 - 24, 2024, Seattle, WA**

THE NEW ELECTRIC SYSTEM: REINVENTION AND RESILIENCE

[10953-2024-GM-Flyer-Digital.pdf](http://10953-2024-GM-Flyer-Digital.pdf) ([pes-gm.org](http://pes-gm.org))

IEEE 2024 PES GM Super Sessions

- Planning for uncertainty in power grid operations





- Trends in changing power system dynamics
- Use of AI in the power grid
- Role of the public in grid planning and operations

PSRC has scheduled 5 two-hour Panel Sessions:

- Improving Protection of Low-Voltage Networks with High DER – Matthew Reno
- Voltage ride-through performance requirements for IBRs considering needs of the power grid – Manish Patel, Deepak Ramasubramanian
- Renewable Energy and Protection Challenges – Kamal Garg, Shuhui Li
- Role of ML/AI in enabling and protecting the grid of the future – Abder Elandalousi, Yi Hu
- Protection Challenges in the Decarbonized and Resilient Power Grid – Yonghao Gui, Aleksander Dimitrovski

39 Papers submitted for PSRC review, 20 accepted; 52 volunteer reviewers – THANK YOU!

Jeffrey Barsch	Alla Deronja	Yi Hu	Trupal Patel
Tony Bell	Kevin Donahoe	Anthony Johnson	Qun Qiu
Sebastien Billaut	Mike Dood	Kevin Jones	Russ Patterson
Munim Bin Gani	Paul Elkin	Chase Lockhart	Clair Patti
Matt Black	Evangelos Farantatos	Amir Makki	Farnoosh Rahmatian
Joerg Blumschein	Phani Harsha Gadde	Todd Martin	Phil Tatro
Oscar Bolado	Han Gao	Rene Midence	Michael Thompson
Sukumar Brahma	Rafael Garcia	Dean Miller	Ian Tualla
Ritwik Chowdhury	Juan Gers	Mukesh Nagpal	Eric Udren
Steve Conrad	Abhilash Gujar	Seth Nelson	Benton Vandiver
Scott Cooper	Gene Henneberg	Jim O'Brien	Roger Whittaker
Manish Das	Michael Higginson	Dean Ouellette	Zhiying Zhang
Brandon Davies		Manish Patel	Karl Zimmerman

Reviewing papers for IEEE Transactions and Conferences is a responsibility of all Main Committee Members.

**IEEE 2025 Grid Edge Conference & Exposition  
January 21-23, 2025, San Diego, CA**

Paper submission site will open from March to April 2024  
IEEE PES Grid Edge Technologies Conference & Exposition  
([pes-gradedge.org](https://pes-gradedge.org))

no statistics yet on paper submittals

1 Panel submitted

Grid, Renewable Generation, Protection Challenges, Kamal Garg (chair)



**B. CIGRE Report - Mladen Kezunovic, (US Rep., B5, Protection and Automation)**

NOTHING TO REPORT THIS TIME.

TRANSITIONING OUT AS CIGRE B5 REP.

JONATHAN SYKES / ALEX APOSTOLOV WILL REPORT IN FUTURE.

**C. IEEE PES Report – Michael Thompson**

Nothing to report at this time.

**D. IEC Report – Eric A. Udren**

IEC Technical Committee (TC )95, *Measuring relays & protection systems*

- Past Chair–Dr. Murty Yalla, US thru 2/24
- Chair–Andrea Bonetti, SE
- Secretary–Thierry Bardou, FR
- 22 participating member nations

*US Technical Advisory Group to USNC for TC95*

- Eric Udren, Technical Advisor to US Natl. Cmte. Of IEC (hosted by ANSI) & Chair of PSRC I4 – hosts topic reviews
- Normann Fischer, Deputy TA and Vice Chair of I4

*Financial & administrative support for US & USNC work in TC 95 standards:*

- US DOE – Pacific Northwest National Laboratories (PNNL)
- Jeff Dagle, PNNL, TAG Administrator
- PNNL covers ANSI fees and keeps US engaged in IEC TC 95 standards

**TC 95 Plenary:**

TC 95 Plenary Meeting plus standards writing teams – Largo, Florida, February 19-22, 2024.

- Hosted by Murty and Hubbell Beckwith.

**Standards Projects:**

Three relay product *design and type test* standards revised with requirements including configuration of relays under test. Approved and published:

- 60255-1 Ed 2 – Common Requirements
- 60255-26 Ed 4 – EMC requirements
- 60255-27 Ed 3 – Safety requirements
- 60255-27 Ed 3 AMD 1 – US
- Commented on CD in February – fixed many bugs.
- 2024 Revision of - 60255-21-1,2,3 – merging into new standard 60255-21 – vibration, bump, shock, seismic requirements – CD returned with comments. *Impacts product manufacturers.*
- IEEE–IEC alignment - our effort since 2000:
  - Comparable type tests should have the same test setups and procedures.
  - Align test levels and values – differences only as clearly justified.
  - Result – vendors and labs can run one set of compliance tests for both IEC and IEEE standards – *huge cost, efficiency, and product reliability benefits.*

**100 Series functional and product performance standards:**

- 60255-187-3 – *Functional standard for line differential relays* – restarted due to 5 year time overrun – work underway.
  - PSRC D34 will restart when needed (Fischer).
  - 87L channel functional test guide covered in separate project TS 60255-216-3.
- 60255-187-2 – *Functional standard for busbar differential relays* – cancelled/ restarted but delayed – first we finish 187-3.
- 60255-132 – *Functional standard for directional power relays* – new project, CD in 2024.
- 60255-167 - *Functional standard for directional relays* – **US and Canadian reviewers identified lists of issues in latest CD, submitted in February.**

**200-series application guides**

- TS 60255-216-1 – *Digital Interface - Requirements for relays with digital I/O (e.g., merging units)* – Technical Report now being revised as a technical standard (TS) – CD due in June. *May be renumbered to 116-1.*
- 60255-216-3 - *Digital Interface – Test specification for protection data communications for Line Current Differential Protection* – CD in process:
  - 87L Protection with TDM or Ethernet, e.g., T1 or MPLS.
  - Specify tests for correct operation in support of 87L function during various power system conditions considering data quality, changes of latency, asymmetric latency, path interruptions/re-routing, and jitter or packet delay variation (PDV).
  - AHG met at FL TC 95 Plenary; on-line meetings are focusing scope
- TC 95 - PSRC JWG for 60255-24/C37.111 dual logo COMTRADE underway – PSRC H54. Next example of new collaboration after 60255- 118-1 IEEE/IEC synchrophasor standard.
- WG3 on Functional requirements for the protection of direct current (DC) transmission and distribution networks is underway.
  - Hasn't met yet – co-chairs are to start the work
- AHG4 on Traveling wave (TW) based protection and fault location – Chair from CN has not begun work; TC appointed US Co-Convenor to get the work moving.

**New Standards Numbering Proposal**

- *Existing* – Product standard numbers remain, e.g., 60255-26 Ed 4, EMC.
- *Existing* - Functional standards – 100 plus the IEEE C37.2 number, e.g. 60255-121 for distance relay functional standard – already being done.
- *New* – Application guides – 200 plus the IEEE C37.2 function number, e.g. 60255-221 (*not yet under development*).
- *Newest* – Functional standards with acronyms in C37.2 or no C37.2 number – 300 plus a sequentially chosen number, e.g. 60255-301-1, traveling wave line relay functional requirements (*not yet under development*).
- *Newest* – Application guides for 300 series functions – 400 plus the corresponding 300 series number.

**IEC Generic Environmental Standards**

- Horizontal standards are intended to apply to all products unless product TC creates its own standard.
- IEC 63366 ED 1 - draft for Product category rules for life cycle assessment – requires study of products and all component parts, based on difficult-to-obtain data. US commented in March that this needs work on organization and practicality.
- IEC Guide 109 ED 4 - *Environmental aspects* – to be made normative in 2024 or standards written in all product committees.

- Mostly not relevant for TC 95 product performance, functional standards, and guides.
- Full of indistinct requirements and references.
- TCs should be able to opt out if not relevant.
- Comments due 5/17.

#### **New Sensor TC?**

- Chinese NC proposed to Standards Management Board (SMB) a new technical committee for sensors in power system applications including microgrids and DER.
- The proposal did not copy TC 38 instrument transformers and measuring devices, or TC 17 switchgear where devices would be used.
- IEC already has a measurement sensor TC 85.
- We recommended to US SMB member that this be voted down

#### **TC 95-PSRC standards collaboration summary**

- US has participants in TC 95 working groups and maintenance teams – ***thanks to supportive employers.***
- US participants are supporting ongoing strategy development.
- We establish PSRC WGs to support complex IEC standard projects to contribute to IEC content and evaluate drafts.
- PSRC product standard WGs have been aligning with IEC TC 95 – especially test procedures for manufacturers.
- **Compliance with aligned international standards improve robustness, safety, and performance of relays.**

***IEEE PSRC and IEC TC 95 are collaborating more than ever to bring the best relays and applications internationally.***

#### **E. B11 Working Group - SC21 and P1547 – Ben Kazimier / Mat Garver / Sean Carr**

##### **Active Standards Projects**

##### **IEEE 1547 Series**

- IEEE P1547 - Revision of 1547-2018
  - Incorporates updates from the previous amendment and industry feedback
- IEEE P1547.1A - Standard Conformance Test Procedures for Equipment Interconnecting Distributed Energy Resources with Electric Power Systems and Associated Interfaces Amendment 1
  - Integrates clarifications and corrections identified in the extensive additions to UL 1741 3rd Ed. Supplement SB that incorporated test procedures in IEEE 1547.1-2020.
- IEEE P1547.4: Islanded Systems (Microgrids)
  - Address increased maturity and complexity of intentional island systems and align with revised standards like 1547, 2030.7/.8/.9, and ongoing projects like P2030.12 and P2988
- IEEE P1547.10 - Recommended Practice for Distributed Energy Resources (DER) Gateway Platforms
  - Enable direct integration of DER with the monitoring and control systems of grid operators
  - Could include emerging capabilities for DERs that would not be included in the revision of the main standard 1547

**IEEE 1547.2 Additional Updates on Other Activities**

IEEE 1547.2 Guide for Application of IEEE Std 1547-2018, *IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces*

- Protection Conference Paper on IEEE 1547.2 Guide Presented
  - Paper Title: "Protection of Distribution Grid with DER and IEEE1547.2-2023 Protection Guidance"
  - Authored by IEEE 1547.2 Guide Working Group Members: Jens Boemer, Sean Carr, Haile Gashaw, Wayne Stec, Jeanette Sandberg
  - Presented at Texas A&M, Georgia Tech, WPRC (Oct 2024)

**IEEE 2030 Series**

- IEEE P2030 -*Guide for Smart Grid Interoperability of Energy Technology and Information Technology Operation with the Electric Power System (EPS), End-Use Applications, and Loads*
  - Provides a knowledge base addressing terminology, characteristics, functional performance and evaluation criteria for connectivity and communications.
  - Update the information related to the seven-domain grid model
  - The application of the IEEE Smart Grid Interoperability Reference Model (SGIRM) framework may be revised based on best practices.
  - A digital model of the SGIRM will be provided.
- IEEE P2030.5- *Standard for Smart Energy Profile Protocol*
  - A protocol that has been instrumental in integrating interoperability into California regulations, and is critical to establishing vehicle-to-grid energy- transfer protocols.
  - Currently Under Revision

**IEEE 1547-2018 Revision WG****Task Force 3 (TF3) Protection Taskforce**

- IEEE 1547-2018 Revision Working Group Voted to form TF3 Protection Task based on request from IEEE PSRC
  - TF3 Protection Task Force has begin meeting weekly (Friday 10:00AM-11:00AM CST)
  - TF3 Facilitator Mike Jensen PG&E
  - TF3 Open to all IEEE Members (looking for input from IEEE PSRC Members)

**(TF3) Protection Topics Relevant to IEEE PSRC**

- Evaluate the interaction of DER LVRT with Area EPS undervoltage protection. Consider whether adjustments to 1547's LVRT requirements are warranted and develop specific recommendations for those adjustments. Coordinate with SG3 and appropriate PSRC WGs.
- Does the use of a 51V or 51C violate the ride through requirements? Does 3Vo tripping violate ride-through requirements? Does the above section apply to fault clearing? If so, should it be worded such that in-section faults can clear faster than 160 ms? Ride through is a capability, requirement – need to balance with protection needs including coordination. "
- Evaluate the interaction of DER fault current with Area EPS protection. Assess whether there are appropriate recommendations for fault current characteristic requirements for DERs. Coordinate with SG6 and appropriate PSRC WGs.
  - i) Modeling requirements, include RMS phase current and I2 current if applicable for the fault current characteristics at nominal AC voltage and I2 current.

- ii) Future requirements (will not be inserted in this change)-specific current and voltage phase angle requirements, specify I2 current injection requirements along with phase angle requirements.
- Evaluate, and develop candidate text for, additional guidance on coordinating DER grounding and transformer configurations with Area EPS ground-fault protection. Coordinate with (SG12) and appropriate PSRC WGs.
- IEEE P1547.2 has an extensive discussion on XMFR configurations and the effect on the Area EPS. This should be reviewed to determine if the information should be brought into the IEEE 1547 Base Standard.
- Voltage-based tripping, including more sophisticated voltage protections such as negative sequence voltage, must be coordinated with DER ride-through requirements which present a significant constraint.
- IEEE 1547 requires DER to be coordinated with Area EPS grounding. This means that the degree of grounding must be compatible with the Area EPS system's design and protection.
- The timing of the phase-to-ground overvoltage protection and DER isolation needs to be coordinated with arrester characteristics and with the overvoltage withstand design level of distribution equipment.
- Protective relaying or devices may sometimes be deployed on the Area EPS side of the PCC, redundant or not with DER system protection. Any redundant protection should be coordinated with protection provided as part of the DER system.
- Evaluate the insertion of 3V0 protection. Should the base standard have a 3V0 protection element requirement? The evaluation should include the voltage ride through implications of applying this element.
- Evaluate the concept "Zones of Protection". The concept of Zones of Protection in regard to the required reach/proper operation of protection elements will be investigated to determine if it should be included in the base standard. This concept is well known and understood within the protection discipline and could be applied to ensure the correct protection elements are applied.
- The "Trip" definition should be reviewed, the industry understanding of trip is complete de-energization of the generation output, the current definitions above do not state de-energized.

#### **If time permits**

- Develop materials for an update to the 2004 PSRC D3 report "Impact of Distributed Resources on Distribution Relay Protection". This material could be submitted to PSRC Committee D as inputs to a possible revision of the 2004 report or included in 1547 as an informative annex. Coordinate with PSRC.
  - a) Update terminology – and DER technology update.
  - b) If needed to be updated, should be recommended to PSRC for update.

### **P1547.10 PAR**

#### **Scope**

This document defines recommended specifications for a Distributed Energy Resources (DER) gateway platform in grid applications across various domains. A description of DER gateway implementation options (local or distributed platform, for legacy or intelligent DERs) is included. Gateway platform functions and communications, including operational procedures and data collection recommendations are described.

Recommended procedures for cybersecurity, centralized manageability, monitoring, grid edge intelligence and control, multiple entities management, error detection and mitigation, events tracking and notification, communication protocol translation, and communication network performance monitoring are also described

**P1547.10 Status**

- Good progress has been made at and after March 2024 1547.10 WG meeting
- Strawman 1547.10 draft exists with some material provided by SGs
- Most SGs have outline and have been filling out their specific topics
- Topics under discussion:
  - a. Interface to multiple managing entities (to be reflected in a diagram)
  - b. DER Gateway access arbitration
  - c. Can a protective relay act as a DER Gateway ?
  - d. Can protection related function be performed by/via DER Gateway
  - e. Communication performance requirements

**Call to Action for IEEE PSRC Members**

## Upcoming IEEE 1547/.x WG Meetings - 2024

- 1547.4 Main WG meeting – May 21-22, 2024 Virtual
- 1547 & 1547.10 Full WG meeting in Andover, MA – June 10-13, 2024 – In-person/Virtual
  - To be hosted by Schneider Electric – Dan Sabin is POC
  - Joint WG Meetings (P1547 Rev, P1547.10)
- 1547.4 Main WG meeting – University of St. Thomas St. Paul, MN-August 13-14, 2024– In-person/Virtual
- 1547.4 Main WG meeting November 19-20, 2024 Virtual
- 1547 & 1547.10 Full WG meeting Virtual– October 2024 (Tentative)
  - Proposed dates and time for future (full) WG meeting: identification of potential conflicts in Fall of 2024
  - Joint WG Meetings (P1547 Rev, P1547.10)

**IEEE 1547.7 PAR**

## Guide for Conducting Impact Studies for Distributed Energy Resource Interconnection

- PAR approved by SC21 (April 2024) pending IEEE SASB approval.
- IEEE 1547.7 Chair Frank Goodman
- PAR Expiration June 2027
- IEEE/PES/T&D Distribution Subcommittee's Distribution Switching and Protection Working Group declined joint sponsorship
- Co-Sponsors IEEE Power and Energy Society/ Analytic Methods for Power Systems (PE/AMPS)
- **Scope** of proposed standard: This guide describes criteria, scope, and extent for engineering studies of the impact on area electric power systems of a distributed energy resource or aggregate distributed energy resource interconnected to an area electric power system.
- **Purpose:** The creation of IEEE Std 1547, "IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power System Interfaces," has led to the increased adoption of distributed energy resources (DERs) throughout distribution systems. This document describes a methodology for performing engineering studies of the potential impact of a DER interconnected to an area electric power system (Area EPS). Study scope and extent are described as functions of identifiable characteristics of the distributed energy resource, the Area EPS, and the interconnection. The guide will also address studies of the impacts of a local microgrid (aggregated DER) on an Area EPS. Criteria are described for determining the necessity of impact mitigation.
- The guide provides information on four types of studies:
  - (1) Screens – simple yes or no tests for interconnections



- (2) Steady-state studies – electrical studies that look at the steady state operation of the interconnection and surrounding EPS facilities.
- (3) Transient and dynamic studies -including power quality issues such as harmonics, voltage, flicker, and other stability issues.
- (4) Impacts on Area EPS protection, communications, and control.
- (5) Other studies – studies that do not fall into the first 4 categories

**MOTION by Ben Kazimier, SECOND by Michael Higginson:**

To have the PSRC become a joint committee in a non-lead role for the revision of IEEE 1547.7 organized under the C Subcommittee as CTF56

**MOTION PASSED UNANIMOUSLY**

**F. Standards Coordinator Report - Don Lukach**

**PSRC Standards (Standards, RPs, Guides)**

65+ Standards

35+ Active PARs

7 Joint Committee PARs with PSRC in non-Lead role

9+ different organizations within IEEE and others like IEC

Numerous Liaisons; External IEEE, Internal IEEE, etc.

**WG and SC Chairs continue to do great processing PARs!**

PSRC in Good Shape.

1 Standard published in 2024.

13 Standards with PARS expiring in 2024. Almost all in active balloting or ballot resolution.

**Update on O&P Manual**

Waiting on the O&P approval from PES – there will be a motion later in the meeting to approve some editorial revisions and omissions prior to submitting draft for PES approval.

*[Editor's note: See B8 WG report later in these minutes.]*

**Post O&P Plan for 2024:** Flowcharts and QRGs (Quick Reference Guides); Working Group Chair Training Materials.

**Other plans:** EPM (Entity) process revision within PSRC

**Standards Coordinator Report**

The PSRC performs a multitude of standard related work including 26 active PARs that the PSRC leads, 7 PARs in non-lead Joint Committee relationships, and multiple additional liaisons with IEEE and external standards organizations. For the current status of all Standards and active PARs refer to the following location <https://development.standards.ieee.org/myproject-web/public/view.html#landing>

As of the May meeting 13 PARs will expire at the end of 2024. Almost all of them are in the process of SA ballot. The exception is PC37.101 Guide for Generator Ground Protection under Working Group J16. The group was recently reformed and will allow this PAR to expire and a new one to be developed in 2025. Refer to Subcommittee J minutes for more information.

**Completed PAR projects in 2024:**

C37.252 Guide for Testing Automatic Voltage Control Systems in Regional Power Grids. This was our Entity lead project from Working Group C39. SASB approved 3/21/24 and the standard is now also published.

**Joint Committee PAR projects that PSRC is in a Non-Lead Role:**

Refer to IEEE SA MyProject for the current status.

Project Number	Committee	Co-Standards Committee	Project Title
PC37.431.20	PE/SUB/WGI9	PE/PSRCC	Guide for Protecting Transmission Static Shunt Compensators
P1854	PE/T&D/SDWG	PE/PSCC, PE/PSRCC	Guide for Smart Distribution Applications
P1547	BOG/SC21/1547_revwg	PEL/SC, PE/T&D, COM/PLC, PE/EDPG, PE/EM, PE/PSCC, PE/PSRCC	Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces
P1547.10	BOG/SC21/P1547.10 DER GP WG	PE/T&D, PE/EDPG, PE/PSCC, PE/PSRCC, COM/PLC	Recommended Practice for Distributed Energy Resources (DER) Gateway Platforms
P2800.2	PE/EDPG/P2800.2 - T&V of BPS-connected IBRs	PE/PSRCC, PE/AMPS, PE/T&D, PE/EM	Recommended Practice for Test and Verification Procedures for Inverter-based Resources (IBRs) Interconnecting with Bulk Power Systems
P2004	PEL/SC/HIL	PEL/SC/HIL	Hardware-in-the-Loop (HIL) Simulation Based Testing of Electric Power Apparatus and Controls
EPM P1952	EPM	EPM	Standard for Resilient Positioning, Navigation and Timing (PNT) End-User Equipment
EPM P3416	EPM	EPM	Guide for Test Sets and Tools for Testing Protective Relays

**IEEE SA Staff Update – M. Zaman****REMINDERS for Standards Committee Officers**

- Officers to complete: Understanding IEEE SA's Antitrust, Competition, and Commercial Terms Policies
  - Training has moved to the volunteer ILN site.
- Reminder to WG chair to email the WG Membership Roster to your PM for Standards Development WGs
  - The membership list should include - Last Name, First Name,, email address and Membership Status (Voting/Non-Member)
- WG Awards are now submitted in myProject, a WG roster is necessary to complete the awards submission.
  - Phone numbers for the recipients is now required
- IEEE SA Editorial Hub - Normative Reference Training
  - Standards developers and working group participants receive a concise overview of the most important and broadly applicable facets of incorporating a normative reference clause and a bibliography into an IEEE standard
- Note the updates to the IEEE SA Standards Board Bylaws and IEEE SA Standards Board Operations Manual, namely Clause 7. Liaisons with organizations external to IEEE
- New Audit Committee (AudCom) Baseline Operating Procedures are available, they were released May 1st
- Interest to be part of the SASB committees, deadline is June 1st

**Please let me know what we can assist you with in 2024.**

**G. PSCCC Committee Report to PSRC – Craig Palmer, Secretary PSCCC:**

- 25 meetings (give or take)
- 73 registered for PSCCC or 'both'
- 4 in PSCCC Newcomers' meeting
- 3 joint meetings between PSCC / PSRC:
  - P21/I49
  - S18/I47
  - P16/H53
- **C3TF** met for the first time, developing a report on 'Special Topics for Power Line Carrier Applied to Power Transmission Lines'
- **P9** – IEEE C37.118.2 Standard for Synchrophasor Data Transfer for Power Systems – Balloting is done, submitted to RevCom for June meeting
- **P10** – IEEE-2664 Standard for Streaming Telemetry Transport Protocol – draft has been approved for publication
- **P15** IEEE-1815.2 Standard Profile for Communications with Distributed Energy Resources (DERs) using IEEE Std 1815 [Distributed Network Protocol (DNP3)] will seek approval to go to ballot
- **S8** – IEEE-P2658 Guide for Cybersecurity Testing in Power Systems – will seek approval to form ballot pool (will seek approval to go to ballot in September)

**H. NERC Report: Rich Bauer****Standard Developments**

- **18 CFR Part 40, Docket No. RM22-12-000; Order No. 901 – Reliability Standards to Address Inverter-Based Resources – Issued October 19, 2023**
- NERC Standards Development Strategy to Address FERC Order 901
  - November 2023
  - Key Factors Included in Strategy
    - Prioritization of NERC Standards Projects
    - Continual coordination between NERC Engineering, Legal, and Standards
    - Ongoing communication to industry
    - Balance with other high priority work
- **High Priority• Completed by 2024**
  - 2016-02 Modifications to CIP Standards - CIP-002, CIP-003, CIP-004, CIP-005, CIP-006, CIP-007, CIP-008, CIP-009, CIP-010, CIP-011, CIP-012-1
  - 2020-02 Modifications to PRC-024 (Generator Ride-through)\*
  - 2020-06 Verifications of Models and Data for Generators\* (IBR Definitions Only)
  - 2021-03 CIP-002
  - 2021-04 Modifications to PRC-002-2\*
  - 2022-03 Energy Assurance with Energy-Constrained Resources
  - 2023-02 Analysis and Mitigation of BES Inverter-Based Resource Performance Issues\*
  - 2023-03 Internal Network Security Monitoring (INSM)
  - 2023-04 Modifications to CIP-003
  - 2023-06 CIP-014 Risk Assessment Refinement
  - 2023-07 Transmission System Planning Performance Requirements for Extreme Weather
- **Medium Priority• Completed By 2025 and Beyond**
  - 2021-01 Modifications to MOD-025 and PRC-019\*
  - 2023-01 EOP-004 IBR Event Reporting\*
  - 2023-09 Risk Management for Third-Party Cloud Services

- **Low Priority**

- 2017-01 Modifications to BAL-003 Phase II
- 2019-04 Modifications to PRC-005-6
- 2021-02 Modifications to VAR-002-4.1 8
- 2021-08 Modifications to FAC-008
- 2022-02 Modifications to TPL-001-5.1 and MOD-032-1 \*
- 2022-04 EMT Modeling\*
- 2022-05 Modifications to CIP-008 Reporting Threshold
- 2023-05 Modifications to FAC-001 and FAC-002 \*
- 2023-08 Modifications of MOD-031 Demand and Energy Data

### Standards Announcement

Project 2020-06 Verifications of Models and Data for Generators - Inverter-based Resource Definitions

The formal comment period and additional ballots for **Inverter-based Resource Definitions** concluded **8 p.m. Eastern, Monday, April 8, 2024**.

The voting statistics are listed below, and the details can be accessed on the [Ballot Results](#) page.

	Quorum / Approval
Inverter-Based Resource (IBR)	83.33% / 67.55%
IBR Unit	83.27% / 61.07%
IBR-related Definitions Implementation Plan	83.21% / 70.04%

### Standards Announcement

Project 2021-04 Modifications to PRC-002 – Phase II

Additional ballots and non-binding polls of the associated Violation Risk Factors and Violation Severity Levels for **Project 2021-04 Modifications to PRC-002 - Phase II** concluded **8 p.m. Eastern, April 11, 2024**.

The voting statistics are listed below, and the details can be accessed on the [Ballot Results](#) page.

Standard	Ballot	Non-binding Poll
	Quorum / Approval	Quorum / Supportive Opinions
PRC-002-5	89.42% / 79.46%	84.96% / 77.96%
PRC-028-1	89.26% / 50.03%	86.59% / 44.83%
Implementation Plan	87.96% / 66.61%	N/A

## Standards Announcement

### Project 2020-02 Modifications to PRC-024 (Generator Ride-through)

The initial ballots and non-binding polls of the associated Violation Risk Factors and Violation Severity Levels for **Project 2020-02 Modifications to PRC-024 (Generator Ride-through)** concluded **8 p.m. Eastern, Monday, April 22, 2024**.

The voting statistics are listed below, and the details can be accessed on the [Ballot Results](#) page.

	<b>Ballot</b>	<b>Non-binding Poll</b>
	<b>Quorum / Approval</b>	<b>Quorum / Supportive Opinions</b>
PRC-024-4	91.51% / 61.73%	89.37% / 63.79%
PRC-029-1	91.01% / 25.37%	88.45% / 25.15%
Implementation Plan	91.14% / 37.50%	N/A

## Standards Announcement

### Project 2023-02 Analysis and Mitigation of BES - Inverter-Based Resource Performance Issues

Initial ballots for draft one of **PRC-030-1 Unexpected Inverter-Based Resource Event Mitigation** and non-binding poll of the Associated Violation Risk Factors and Violation Severity Levels concluded **8 p.m. Eastern, Thursday, April 18, 2024**.

Voting statistics are listed below, and the [Ballot Results](#) page provides the detailed results.

	<b>Ballot</b>	<b>Non-binding Poll</b>
	<b>Quorum / Approval</b>	<b>Quorum / Supportive Opinions</b>
PRC-030-1	92.78% / 21.19%	90.08% / 13.11%
Implementation Plan	92.81% / 30.6%	N/A

## Disturbance Reports

- **2022 California Battery Energy Storage System Disturbances**
  - California Events: March 9 and April 6, 2022
  - Joint NERC and WECC Staff Report
  - September 2023

## I. Renewable Systems Integration Coordinating Committee (RSICC) Update -Kamal Garg

### RSICC (Renewable System Integration Coordination Committee) Committee Meeting

- July 20, 2023 9.00 AM – 12.00 PM EST During IEEE PES GM Meeting
- The role of RSICC is to serve as a focal point within the Power and Energy Society (PES) for the identification of challenges associated with the integration of renewable energy resources, related energy carriers (storage, fuels, heat) and related electrification applications (transportation, buildings, industry.)
- RSICC is leading the drafting of PES road map chapter two – renewable integration. Manish and I provided input to chapter 2 from PSRC.

- Each subcommittee (10) provided 10 minutes update of activities related to Renewable energy.
- IEEE PSRC 2024 GM Update
  - Working with Manish Patel. Will reach out once schedule is final for GM 2024
  - WG and reports related to IBR protection issues

## J. Other Reports of Interest

### In Memoriam:

James W. Ingleson 1948-2024

- 9 years Protective Relay Engineer at General Electric
- 28 years with NY Independent System Operator.
- Past I SC Chair of the PSRC and recognized with a Distinguished Service Award.
- Musically talented. Member of several community bands; once founded and led a Dixieland band.



## IV. Advisory Committee Reports: - Michael Thompson

### **B1: Awards and Technical Paper Recognition Working Group**

**Chair:** Andre Uribe

**Vice Chair:** Mal Swanson

**Secretary:** Miguel Rios

**Assignment:** Nominate PSRC sponsored papers, standards, and reports for PES Technical Council and IEEE awards. Nominate individual members and WG's for award recognition.

**WG Members:**

- |                 |                  |                  |
|-----------------|------------------|------------------|
| ▪ Manish Patel  | ▪ Angelo Tempone | ▪ Don Lukach     |
| ▪ Alla Deronja  | ▪ Will English   | ▪ Brian Mugalian |
| ▪ Mital Kanabar | ▪ Brandon Davies |                  |

Next PSRC/PSCC Awards Ceremony will be held in:

**Scottsdale, AZ**

**Monday September 9, 2024**

Embassy Suites by Hilton Scottsdale Resort

During our Monday Reception starting at 6:30PM

### **Standards WG Awards/Certificates – Reminder:**

*Once your work has been completed and the standard has been approved, Chair or VC should request for Certificates of Appreciation directly to the IEEE Standards Association.*

**REQUEST INSTRUCTIONS**

1. Visit the IEEE SA AWARDS website:  
<http://standards.ieee.org/develop/awards/wgchair/wgawards.html>
2. Provide Your Working Group information
3. Include: Your Name | You Contact Number | Your Email Address
4. Allow six weeks for processing
5. Have them mail your certificates to:  
**Embassy by Hilton Scottsdale Resort**  
5001 N Scottsdale Rd, Scottsdale, AZ 85250
6. Correspondence: [andre.uribe@ieee.org](mailto:andre.uribe@ieee.org)

**Uncollected Awards List**

PLEASE contact WG B1 Secretary Miguel Rios to pick up awards for yourself or your co-workers.

**Minutes of the B1 WG Meeting:****B1 Awards and Technical Paper Recognition Working Group**

**Assignment:** Nominate PSRC sponsored papers, standards, and reports for PES Technical Council and IEEE awards. Nominate individual members and WG's for award recognition. No report.

**B2: Fellows Award Working Group**

**Chair:** T.W. Cease

No report.

**B3: Membership Working Group**

**Membership Activity Report** - May 17, 2024

**Membership Chair:** Mal Swanson

**Membership Vice Chair:** Cathy Dalton

**Established Date:** Circa 1995

**Expected Completion Date:** On-going

**Assignment:** Assist in searching for new attendees. Requesting support from attendees' employers.

Attendance during the May 13 meeting was 230, consisting of 214 in-person and 16 on-line. This is close to our normal attendances for a face-to-face meeting.

12 attendees were in our Newcomers Orientation meeting on Monday. Cathy Dalton sent follow up meeting emails to each newcomer, to support our retention program. In that way we are encouraging each of the newcomers to continue their attendance and participation.

No management support letters were sent. If any attendee or potential attendee needs stronger management support for PSRC participation, we encourage them to let us know.

**B4: Long Range Planning Working Group**

**Chair:** Murty Yalla

No report

**B5: Publicity Working Group**

**Chair:** Cathy Dalton

**Vice Chair:** Malcom Swanson

**Secretary:** Melvin Moncey-Joseph

**Assignment:**

- Promote IEEE PES PSRC Committee activities globally.
- Facilitate global outreach using tools such as webinars, tutorials, trade publications, and other similar methods.
- Strengthen PSRC awareness by preparing technical articles as may be required for the promotion of technical committee working group activities about the art of relaying, and the work of the PSRC.

Based on some great feedback from other PSRC members, Cathy requested to expand the Publicity working group and invite new members to assist with all the great ideas we would like to implement. This is based on the need to continue to actively raise awareness of PSRC, to recruit additional members, and to retain existing members.



She requested that we add a B5 working group meeting to the PSRC agenda on Tuesdays after the Newcomers Orientation session (9:20-10:30am). She asked the subcommittee chairs to request volunteers (to join B5) during their subcommittee meetings on Wed afternoon. We have a core group of volunteers currently: Andre Uribe (Marketing on LI), Melvin Moncey Joseph (Young Prof Network, conference collaboration), Rick Gamble (Web). Still needed are the following: PSCC representative, Social media guru, and others who are passionate about raising awareness of PSRC.

Cathy provided two slides to subcommittee chairs (K, J, D, C, I, H) to use as a tool to get them excited and raise awareness that assistance is needed. Mike Thompson agreed to request volunteers also during the Main committee meeting on Thursday.

We discussed Young Professional Network and possibly adding a social event on Wednesday. Mike Thompson agreed that we could monetarily support such an event. Melvin is already starting this network with JTCM, but not yet at the PES general meeting. We would like to start this initiative at PSRC, possibly In Scottsdale.

PACWorld Update: Cathy Dalton submitted information to include in PSRC update for the next issue of PACWorld, based on information discussed at January 2024.

#### Initial Ideation for Publicity WG (B5)

- Young Professionals Network—organize Wed eve social event
- Conference collaboration (Texas A&M, GA Tech, WPRC, etc.)—Raise awareness for how to participate in Standards development
- Publications (IEEE PES magazine, PACWorld, etc.)
- Tutorials via Web / conferences
- Website feed to LinkedIn group page
- LinkedIn Group page—"IEEE PES PSRC (Andre initiated 5/13/24)
- LinkedIn posts from events such as Awards ceremonies
- Many other ideas to discover and implement....

Cathy and working group members will respond to requests as they arise, to continue to promote PSRC with publicity, and to promote membership and participation.

### **B8: O&P Manual Revision and Working Group Chair Training Working Group**

**Chair:** Don Lukach

O&P is nearly complete, working its way through Technical Council.

**MOTION** by Jim Niemira, **SECOND** by Ritwik Chowdhury

Accept editorial revisions as noted prior to submittal to Tech Council:

#### **Motion to approve revised O&P Manual**

The substantive modifications are to these three clauses:

**3.2.3 Secretary**, Added requirements for a meeting first notice listed in the existing O&P that was inadvertently left off of the new O&P.

**3.2.5 PSRC Members**, Added requirements for membership listed in the existing O&P that were inadvertently left off of the new O&P.

**6.1.3 Appointment of Subcommittee Officers**, Modified text such that the committee chair approves the appointment of both SC chair and vice-chair.

**MOTION PASSED.**

Revised Draft O&P Manual will be posted to the PSRC Website and submitted to Tech Council for approval.

Quick Reference Guides (QRGs), flowcharts, etc., for the P&Ps, O&P, and WG Training will be the next focus for B8 starting at the JTCM in 2024.

### **B9: Web Site Working Group**

**Chair:** Rick Gamble

Nothing to report.

### **B11: SC21 Distributed Resources Standard Coordination**

**Chair:** Benjamin Kazimier

**Vice Chair:** Mat Garver

**Output:** Standard Coordination

**Established Date:** September 15, 2022

**Expected Completion Date:** Undetermined

**Draft:** N/A

**Assignment:** Coordination of SC21 & P1547 standards

**Meeting Date:** May 15, 2024

#### **Meeting Participants:**

<u>Name</u>	<u>Affiliation</u>	<u>Voting Status</u> (voting member, non-voting member, Participant)
Benjamin Kazimier	Bender	Chair
Mat Garver	Hubbell (Beckwith)	Vice-Chair
Wayne Stec (Virtual)	Distregen	Voting Member
Galina Antonova	Hitachi Energy	Voting Member
Sean Carr	ComEd	Liaison
Chip Christmann	Basler Electric	Participant
Addis Kifle	GTC	Participant
Kamal Gag	SEL	Participant
Eric Thibodeau	Hydro-Quebec	Participant
Charlie Sufana	Retired	Voting Member
Jeff Barsch	AEP	Participant
Steve Conrad	Retired	Voting Member
Manish Patel	EPRI	Voting Member

**Time called to Order and Chair's remarks:** The meeting was called to order at 8:00am Eastern Time and introductions were made.

**IEEE Policy Reminders (patents and copyrights):** N/A.

**Confirm that call for Patent issues was made and record any responses:** N/A.

**Times of any recesses and time of final adjournment:** meeting adjourned @ 9:12AM EST

**Date, time, and location of next meeting:** Sept 2024, Scottsdale, AZ

MMR: Request that B11 continue show "open to all" on the agenda and that we try to find a better time slot for the meeting. Attendance is still down due to several scheduling conflicts.

\*\*\*\*\*Mat is also Vice Chairing D45, K25, & I36. It would be desirable not to have B11 coincide with those meetings either.

\*\*\*\*\*Galina is Secretary of D47. It would also be desirable not to have B11 coincide with D47 either.

#### **Topics discussed:**

- Sean Carr gave an update on the 1547 groups (see his PPT).
- Galina Antonova gave an update on 1547.10 (See PPT).

- Wayne Stec gave update on other 1547 standards.
- Upcoming 1547 meeting dates were discussed.
  - 2<sup>nd</sup> meeting will be in Andover, MA in summer of 2024
  - 3<sup>rd</sup> meeting will be in Atlanta, GA in fall of 2024
- Eric Thibodeau announced he is the chair of IEEE 1815
- P1815.2 which is the DNP3 Profile for DER. 1815 itself is the DNP3 standard, which is widely used in SCADA... It is also under revision by PSCC P2, but this revision has little to do with DER. PSCC P15 Working Group finished drafting P1815.2 (DNP3 Profile for DER) mid-April. Draft was approved unanimously to go to ballot by the WG through an email vote that ended on May 7. We are looking to get approvals from PSCC P0 Subcommittee and PSCC Main Committee that meet in Buffalo on May 15 and 16. They expect the MEC review to start within the next two weeks, and the ballot invitation to be sent out about the same time. 1815.2 PAR expires in December 2025, by which they should be done.
- Galina's last slide has an important update. It needs to be in the main committee update report.
- Jeff Barsch had a question for understanding from AEP. There seemed to be multiple interpretations of the addition of statement of the following statement to 1547-2018 SG3: *“Short-circuit faults within the Local EPS that cannot be cleared except by disconnecting the DER [system] from the Area EPS.”* The question was regarding if there is a fault on a transmission line feeding a tapped distribution sub, which in turn serves a Point of Common Coupling for a DER, how is this situation handled? What is the definition of Local EPS? (see Word Document attachment)

#### Action Items:

- Try and get a more participation in B11

#### V. Subcommittee Reports to the Main Committee:

*(Editor's note: here are brief summary reports made to the Main Committee that highlight significant Subcommittee activities. Complete Subcommittee Meeting Minutes and WG Minutes are included as Addendum A to these MC Minutes. Subcommittee reports are presented alphabetically by Subcommittee for ease of reference; actual sequence of reporting at the MC meeting was K, J, D, C, I, H)*

**Recommendation from the PSRC Secretary:** For any Motions made and balloted outside of regular meetings, for example if a SC uses an email ballot to approve a Report, be sure to include the complete wording of the Motion and results of the ballot in the “Old Business” section of the group's next regular meeting Minutes so that the motion and result of the ballot will be included in the record of PSRC activities and posted to the PSRC website. This applies to all groups: WG, SC, or MC.

#### **“C” Subcommittee Report – System Protection**

Chair: Michael Higginson

Vice Chair: Manish Patel

Refer to C SC Minutes for complete report.

Met on May 15, 2024, did not meet quorum; attendance figures will be in the C SC Minutes

New member Melvin Moncey-Joseph. Welcome Melvin!

Rafael Garcia has retired and asked to be made a guest. Thank you for your contributions to C SC, Rafael!

#### **Standards Projects Status Updates**

**C33:** P2004 Recommended Practice for HIL Simulation Testing Power Apparatus & Control

Standard is in IEEE SA recirculation balloting.

**C38:** P2030.12 Guide for Design of Microgrid Protection Systems

Resolving recirculation ballot comments resolved.

Expecting second recirculation shortly.

**C39:** C37.252 Guide for Testing Automatic Voltage Control Systems in Regional Power Grids

Completed standard. Working group is disbanding.

**C52:** C37.246 IEEE Guide for Protection Systems of Transmission-to-Generation Interconnections

Second WG meeting, par approved in March.

#### **Non-Standards Projects Status Updates: Completed Work**

**C44:** Summary paper on the Modification of Commercial Fault Calculation Programs for Wind Turbine Generators

Completed paper and disbanded.

**C46:** Synchronization, Calibration, Testing, and Installation of Phasor Measurement Units (PMUs) for Power System Protection and Control

Completed paper (accepted by TPWRD) and disbanded.

#### **New Task Force**

**CTF55:** Synchro-Waveform/ Continuous Point-On Wave/Synchronized Measurement

Proposed by C23 Coordination of Synchrophasor Related Activities

C subcommittee created TF to investigate interest

#### **New Task Force**

**CTF56:** IEEE 1547.7 Guide for Conducting Impact Studies for Distributed Energy Resource Interconnection Collaboration

### **“D” Subcommittee Report – Line Protection**

Chair: Meyer Kao

Vice Chair: Alla Deronja

Refer to D SC Minutes for complete report.

Met on May 15, 2024, 4:20 PM CST

15 Active Working Groups and 2 Task Force within the D-Subcommittee

IEEE Standards Documents – D-SC

No.	Approval Date	Name
*C37.113	2015	Guide for Protective Relay Applications to Transmission Lines
C37.114	2014	Guide for Determining Fault Location on AC Transmission and Distribution Lines
*C37.243	2015	Guide for Application of Digital Line Current Differential Relays Using Digital Communication
*C37.104	2022	Guide for Automatic Reclosing on AC Distribution and Transmission Lines
C37.230	2020	Guide for Protective Relay Applications to Distribution Lines

\*WG currently working on revision

#### **D-Subcommittee Active WGs & TFs**

**D29:** Tutorial for Setting Impedance-Based Power Swing Relaying on Transmission Lines

**D30:** Tutorial on Application and Setting of Ground Distance Elements on Transmission Lines

**D34:** Coordinate with IEC 60255-187-3 (functional specification for line current differential requirements)

**D35:** Evaluation of Transmission Line Pilot Protection Schemes

**D37:** Report on Impact of Series Compensation on Transmission Line Protection

**D38:** Impact of High SIR on Line Relaying

**D42:** Revise IEEE Std C37.113-2015, IEEE Guide for Protective Relay Applications to Transmission Lines

**D43:** Report, Effect of Distribution Automation on Protective Relaying

**D44:** IEEE Guide for Determining Fault Location on AC Transmission and Distribution Lines

**D45:** Prepare a technical report to the line protection subcommittee to “document protection methods used to reduce wildfire risks due to transmission and distribution lines.

**D47:** Revision of C37.243 IEEE Guide for Application of Digital Line Current Differential Relays Using Digital Communication

**D48:** Investigate the need to create report on Single phase trip and reclose on transmission lines

**D51:** Single Phase Tripping and Reclosing of Distribution Lines

**D53:** Report on distribution line protection practices survey

**D54:** Protection methods for non-effectively grounded distribution systems

**DTF52:** Task Force on investigating forming a Working Group on “Line Protection based on Transient Quantities”

**DTF55:** Task Force on Protection of HVDC systems and dc distribution systems

### **D-SUB WORKING GROUP**

**D30:** Application and Setting Mho/Quad Distance Elements on TLines

Chair: Karl Zimmerman, Vice-Chair: T. Warren

- Balloting has met Subcommittee  $\frac{3}{4}$  approval criteria
- Resolving D-Sub balloting comments

**D35:** Evaluation of Transmission Line Pilot Protection Schemes

Chair: Rick Gamble, Vice-Chair: Brandon Lewey

- Balloting has not met Subcommittee  $\frac{3}{4}$  approval criteria
- Resolving D-Sub balloting comments

**D43:** Update PSRC Report, Effect of Distribution Automation on Protective Relaying

Chair: G. Ryan, Vice-Chair: A. Zamani, Secretary: J. Hughes

- Balloting has not met Subcommittee  $\frac{3}{4}$  approval criteria
- Resolving D-Sub balloting comments

**D44:** Revise C37.114, IEEE Guide for Determining Fault Location on AC Transmission and Distribution Lines

Chair: Sebastien Billaut, Vice-Chair: K. Zimmerman; Secretary: L. Tuladhar

- In the process of IEEE-SA balloting

### **New Task Force**

**DTF56 Task Force:** Investigate forming a WG on the subject of pilot protection application using IEC 61850. **Chair:** Alex Apostolov

### **“H” Subcommittee Report – Relaying Communications and Control**

Chair: Hugo Monterrubio

Vice Chair: Mital Kanabar

Secretary: Dean Ouellette

Refer to H SC Minutes for complete report.

**H SC** met May 15, 2024, with 24 Members and 20 guests. Quorum was established.

The SC Chair introduced the new H Secretary: Dean Ouellette

Two motions were presented and approved during the SC Meeting:

**H44** motions to extend the PAR for IEEE Guide P2030.100.1, for Monitoring and Diagnostics of IEC 61850 Generic Object Oriented System Event (GOOSE) and Sampled Values, for 2 years.

Reason: Working group review of the complete document identified the need for major reorganization of the content. Reorganization is very close to be completed. Once completed, the document will be circulated to the WG members for final comments. They expect to go to ballot in 2025.

**H45 Motion:** Working Group H45 motions for (minor) modification of the scope of the PC37.300 Guide for Centralized Protection and Control (CPC) Systems within a Substation as follows (proposed changes are highlighted in red):

Reason: Based on the IEEE Initial Ballot comments disposition agreed by WG membership.

**The H SC has 5 WG's with PAR's expiring at the end of 2024.** This is their status:

**H22 C37.249 Guide for Cyber Security for Protection Related Data Files** The WG has completed their work and will request to be disbanded in September

**H27 C37.251 File Format for IED Configuration Data (COMSET)** Has 3 comments from ballot to resolve in a few weeks. They expect to complete resolutions by July and the WG should be done before September.

**H40 C37.1.2 Databases Used in Utility Automation Systems** WG is in ballot resolution. They will complete their work this year so they won't need an extension.

**H44 C2030.10.1.1 Monitoring and Diagnosing IEC 61850 GOOSE and SV Based Systems.** Got approved to request a PAR extension. Will go to ballot in 2025.

**H45 C37.300 Guide for Centralized Protection and Control (CPC) Systems within a Substation.** Close to complete ballot resolution. Will recirculate new draft in June.

**Other H SC activity:**

**WG H6 Summary Paper: Application Testing of IEC 61850 Based Systems**

Working Group done with the paper. Minor cleanup will happen, and they will submit to the SC.

**WG H51 C37.239 COMFEDE Revision**

WG lost editor and that delayed completing their work. WG just signed up a new one. Work is almost done.

**HTF56 New H SC Ideation Meeting**

This new task force was created to provide a forum where H SC members and guests could brainstorm to try identify ideas for future H scope related TF or WG's. In our first meeting we had 4 of our Gurus and Visionary Experts, Eric Udren, Alex Apostolov, Mark Adamiak and Ratan Das share their ideas of what they see as future trends and topics that could fall under the H scope and that could potentially benefit our industry.

The meeting generated 24 potential ideas that will be further analyzed, categorized and discussed to see if there are merits to create a new TF or WG in the future. Any ideas that may fall outside our H scope will be shared with other SC's/Committees. We will continue to host this H Ideation Session in future PSRC meetings, and we extend an invitation to everyone on PSRC to participate.

**"I" Subcommittee Report – Protection and Control Practices**

Chair: Ritwik Chowdhury

Vice Chair: Angelo Tempone

Refer to I SC Minutes for complete report.

I SC met Wednesday, May 15, 2024, with 20 members— quorum was established. Complete attendance will be in the minutes.

- 39 Members
- Approved I SC Minutes from January 2024
- Currently 17 Groups:

- 16 WGs
- 1 TF (1 PAR Study Group)
- 3 WGs disbanded (two this meeting, one earlier)

**WG updates of note:**

- **I31** published!
  - IEEE Std 1613 IEEE Standard for Environmental and Testing Requirements for Devices with Communications Functions used with Electric Power Apparatus
  - WG I31 Disbanded
- **I2** – *Terminology Review*
  - Now also reviewing terms for non-PAR outputs (e.g., reports, summary papers). If you are writing a report, follow the procedure they are providing.
- **I26** – *Report on Mathematical Models of Current, Voltage, and Coupling Capacitive Voltage Transformers*
  - Disbanded
- **I44** – *Report on skill sets required by relay test technicians for setting, commissioning, and testing relay systems, given new technologies such as IEC 61850*
  - SC Ballot complete, resolving comments.
- **I32** – *Survey relay test practices*
  - Working group finalizing the draft. Will send out for review in 2024.
- **I36, I37, I40** - C37.90.x
  - C37.90 balloting body is being formed until June 13,2024.
  - C37.90.1 recirculation wrapping up. Roger Whittaker is retiring and was instrumental in this work.
  - C37.90.2 initiated recirculation and is working toward completion.
- **I50** – Summary Paper for IEEE Std C37.92-2023 Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources. Outline and assignments developed.
- **ITF52** – PAR Study Group determined that corrigendum is needed. PAR will be submitted. Plan is to add informative footnote.
- **I49** – *Report on Roadmap developing new or updating existing IEEE standards to address issues of Centralized Protection and Control (CPC) Systems*
  - PSRC I-SC is joint sponsor with PSCCC (P21) as lead.
  - PSCCC P21 and PSRC I49 had a joint meeting.
  - Work is progressing well with meetings every two weeks. Plan to complete work late 2024/2025.
- **I47/S18** – *Revise: IEEE C37.231-2006 – IEEE Recommended Practice for Microprocessor-Based Protection Equipment Firmware Control*
  - PSRC I-SC is lead sponsor with PSCCC as joint.
  - Elevated to a standard with a new name.
  - Working on outline modifications, plan to have writing assignments from September 2024.
- **I33** – *Report on Review of Relay Testing Terms*
  - Resolving comments from latest round of recirculation.
- **I48** – *Review and revise C37.103-2015 – IEEE Guide for Differential and Polarizing Relay Circuit Testing.*
  - Reviewing sections.
- **I45** – *Investigation of Grounding and Bonding Issues Associated with Substation Wiring Practices and Instrumentation*
  - WG ballot is being initiated.



- **I51** –*Summary Paper for IEEE Std C37.110 Guide for Application of Current Transformers for Protective Relaying Purposes*
  - Need participation.
- **I43** – *Report on Response to USA executive order regarding EMP protection*
  - Continuing to work on the report.
  - Expecting WG and SC Ballots in 2024
- **I46** – *Review and revise: IEEE C57.13.3-2014 – IEEE Guide for Grounding of Instrument Transformer Secondary Circuits and Cases.*
  - Ready to go to SA ballot. Received SC approval.

## OTHER TOPICS

### Liaison Reports:

- Johnny Moore had nothing to report on PSIM because they did not meet since January (will meet at PESGM).
- Angelo Tempone monitoring Entity Standard P3416 Guide for Test Sets and Tools for Testing Protective Relays. Jun Verzosa will be our new liaison.
- Transformers Committee—need new liaison now that Will Knapek has retired.

See meeting minutes.

### **MOTION by Ritwik Chowdhury, SECOND by Tony Johnson:**

PSRC accept Joint Committee work of the *Recommended Practice on Unique IDs and Smart Tags for Supply Chain and Asset Traceability for the Electric Grid* with Ritwik Chowdhury making a motion in the role of Liaison

**Title:** Recommended Practice on Unique IDs and Smart Tags for Supply Chain and Asset Traceability for the Electric Grid

**Lead Committee:** Switchgear Committee, Transformers, Insulated Conductors Committee, Energy Development and Power Generation (EDPG)

**PSRC Role:** Liaison

**PSRC SC/ Group:** SC I

### **MOTION PASSED UNANIMOUSLY**

### **“J” Subcommittee Report – Rotating Machinery**

Chair: Will English

Vice Chair: Jason Eruneo

Refer to J SC Minutes for complete report.

**J SC** met Wednesday, May 15, 2024, with 22 members present – quorum was met

- **J6/JTF28** Protection Issues Related to Pumped Storage Hydro Units – Report will be sent to MC Officers by end of May
- **J20** Practices for Generator Synchronizing Systems – Report published and posted
- **JTF29** J Subcommittee Scope Review - Add IBR Protection to scope?
- **J30** Summary Paper Revision of C37.102, Guide for AC Generator Protection – New Working Group, first meeting

### **Three PAR activities:**

- **J16** Revise C37.101 Generator ground protection: PAR will expire December, 2024. A new revision PAR will be needed
- **J17** Revise C37.102 AC generator protection: Awaiting publication
- **J22** Revise C37.96 Motor protection: Work continues, still need figures from earlier document; PAR closes December, 2025

**“K” Subcommittee Report – Substation Protection**

Chair: Adi Mulawarman

Vice Chair: Brandon Davies

Refer to K SC Minutes for complete report.

Met May 15, 2024. Quorum Met

- Published guide (PAR)
  - K26 C37.109 guide published!
- Completed summary paper/ppt/report
  - Nothing to report since last meeting.
- 2 new task forces
  - 1 ready for PAR submission by Sept 2024
  - 1 not ready, need 1 more meeting in Sept 2024.

**Established WG’s continuing work: (7 WGs + 2 TFs)**

- **K12/Sub I9** – Static Shunt Compensators
- **K25** – Shunt Capacitors
- **K27** – Utility-Consumer Interconnections
- **K29** – Reducing outage durations
- **K31** – Breaker Failure
- **KTF32** – Investigate on need for clarification of ungrounded bus protection from bus protection guide (will become WG K32 in Sept 2024)
- **KTF33** – Investigate on the need for creating protection guide for filter banks.
- **K34** – Develop Summary Paper for C37.109 (Shunt Reactor Protection Guide)
- **K35** - Develop Report on applying ground detection banks to ungrounded systems or systems that can become unintentionally ungrounded.

**MOTION:** Adi Mulawarman - K SC motions to disband WG K26

Reason : WG K26 completed its assignment.

**SECOND:** Steve Conrad

Motion PASSED

**MOTION:** Adi Mulawarman

**Motion:** *KTF 33* motions to form a working group with the assignment to submit a PAR and to prepare amendment to IEEE C37.234-2021 Guide for Protective Relay Applications to Power System Buses, to add a statement to limit the applicability of clause 8.3 to ungrounded systems with largely balanced shunt capacitance to ground and to add guidance on systems with large unbalance shunt capacitance.

**Scope:** This amendment to IEEE C37.234-2021 Guide for Protective Relay Applications to Power System Buses limits the applicability of clause 8.3 to ungrounded systems with largely balanced shunt capacitance to ground and adds guidance on systems with large unbalanced shunt capacitance.

**Purpose:** When ungrounded buses have a large shunt capacitance unbalance, the resistor’s role is not limited to stabilizing the bus voltage. Large shunt capacitance unbalances will lead to a stable unbalanced voltage that may lead to difficulties in identifying faulted conditions when the zero sequence voltage becomes large. A larger resistor power rating and a lower resistor impedance value can allow for more reasonably balanced phase voltages by limiting zero-sequence voltage across the resistor or other mitigation solutions.

**SECOND:** Sebastien Billaut

Motion PASSED

**VI. Presentations to the Main Committee:**

**PRESENTATION – Exploring IEEE C37.120-2021 Guide for Protection System Redundancy for Power System Reliability** – Presented by Melvin Moncey Joseph, PE, Burns & McDonnell, Austin, Texas

**VII. Old Business:**

No Old Business

**VIII. New Business:**

No New Business

**IX. Announcements:**

Next meeting will be In Person format at the Embassy Suites by Hilton Scottsdale Resort, Scottsdale, AZ. PSRC will have one meeting room with conference telephone to support those WG that would like to set up their own hybrid meeting.

**X. Adjourn:**

Motion to Adjourn by Mukesh Nagpal; second by Don Ware.  
Meeting adjourned 10:43 AM EDT.

Respectfully Submitted,  
James K. ("Jim") Niemira  
Secretary, IEEE/PES PSRC

**Addenda:**

**Addendum A: Minutes from Subcommittee and Working Group Meetings:  
SC C, D, H, I, J, K**

**Addendum B: PSRC May 2024 Meeting Agenda, Draft 8 (Final)**

**Addendum A: Minutes from Subcommittee and Working Group Meetings:  
SC C, D, H, I, J, K**

## System Protection “C” Subcommittee of the PSRC

May 15, 2024 Minutes

**Chair:** Michael Higginson [Michael.Higginson@sandc.com](mailto:Michael.Higginson@sandc.com)

**Vice Chair:** Manish Patel [manpatel@epri.com](mailto:manpatel@epri.com)

### System Protection Subcommittee Scope

Evaluate protection systems responses to abnormal power system states. Evaluate and report on special protection schemes, remedial actions schemes, monitoring and control systems and their performance during abnormal power system conditions. Recommend corrective strategies and develop appropriate standards, guides, or special publications. Evaluate and report on new technologies which may have a bearing on protection system performance during abnormal power system conditions.

### Meeting Minutes

The System Protection Subcommittee of the PSRC met on May 15, 2024, at 2:45 PM Eastern Time. Members and guests in presence introduced themselves and indicated their affiliations. A quorum was not achieved (26 out of 53 members and 40 guests).

The Subcommittee reviewed the agenda but was not approved due to lack of quorum.

The January 2024 minutes were reviewed but were not approved due to lack of quorum. They will be presented for approval in next meeting.

### Advisory Committee and Other Items of Interest

- Prices at future meetings are likely to increase.
- Please register for meetings early. Late registrations are challenging to manage.
- Registration for this PSRC meeting was 215 people, with 209 in person registrants.
- Upcoming meetings:
  - September 2024: Scottsdale, AZ
  - January 2025: Garden Grove, CA
  - May 2025: Portland, OR
- The Awards Ceremony will take place during the Monday night reception for May and September meetings. Please consider this when making your travel plans.
- Tuesday lunch-and-learn will be regular feature at PSRC meetings.
- Going forward, May and September meetings will be face-to-face only. PSRC will allow very limited hybrid meetings. WG leadership will carry burden of setting up meetings, recording attendance, etc. PSCC will support hybrid meetings. JTCM will support hybrid meetings.
- Working Group (WG) and Task Force (TF) Leadership Guidance
  - Please inform early if WG/TF will not be meeting – scheduling is extensive effort.
  - Working group agendas are required to be posted at least two weeks prior to the meeting.
  - Working group meeting minutes due to Manish and Mike by Friday, May 24, 2024. Please use the provided Word template to capture meeting minutes, including your assignment.
  - PSRC’s Policies and Procedures for Working Groups clause 6.4 requires that meeting minutes for Subcommittee, Working Group, and Task Force meetings include a list of attendees. Names and affiliations of attendees are required to be included in meeting minutes. Including membership status is also recommended.
  - Working groups that complete their work are encouraged to present it to the IEEE community through WEBEX. Contact PSRC officers or Cathy Dalton (Publicity Chair) for further information.
  - WG Chair or Vice Chair can request award from IEEE SA after PAR WG completion.

- Andre Uribe can address any open questions.
- PAR-related Working Group chairs are required to have IEEE PES and IEEE SA memberships. IEEE PES and IEEE SA membership is encouraged for all working group leaders.
  - Working groups with a PAR must show Copyright Policy, Patent Policy, and Participant Policy (new addition) slides at each meeting. Working groups without a PAR must show Participant Policy (new addition) slides at each meeting.
  - The B5 Publicity WG is requesting volunteers. If interested, please contact Cathy Dalton ([cdalton@epri.com](mailto:cdalton@epri.com)).
  - The roll out of a new member management system (Member Planet) is in progress. Before this new system is implemented, please be sure to follow required confidentiality practices. Ensure the BCC is used so that email addresses of members are not shared for general correspondence.
  - P&P for Standards and P&P for Working Groups have been updated. The O&P is awaiting approval by the technical committee. All PSRC procedures are available at <https://www.pespsrc.org/knowledgebase>.
  - All are reminded and encouraged to apply for Senior Membership in the IEEE if you are eligible.
  - Emails with some attachments are blocked by some participants' firewalls. Please be aware of this when sending files via email.

### **Working Group Reports**

The minutes of the Working Groups are attached.

### **Old Business**

None.

### **New Business**

Mike Higginson informed the attendees that IEEE C37.247 Standard for Phasor Data Concentrators for Power Systems expires in 2029. Attendees were asked if there is interest in creating a task force to investigate revising or reaffirming this standard. It was recognized that the reaffirmation process is not available anymore. An alternative is to submit the PAR and then ballot the standard as-is. There were no volunteers to lead the Task Force.

Ben Kazimier noted that IEEE Standards Committee 21 is submitting a PAR to revise IEEE 1547.7 Guide for Conducting Impact Studies for Distributed Energy Resources. The proposed scope is:

This guide describes criteria, scope, and extent for engineering studies of the impact on area electric power systems of a distributed energy resource or aggregated distributed energy resource interconnected to an area electric power system.

The C-SC was asked if there is any interest, pending approval by the Main Committee, in cosponsoring this PAR. Some in attendance expressed interest. Given some interest, Ben Kazimier will make a motion at the Main Committee meeting to cosponsor IEEE 1547.7 revision PAR in a non-lead role.

Mike Higginson informed the attendees of following EPMs, both of which are outside of the C-SC scope:

- Unique IDs and Smart Tags for Supply Chain and Asset Traceability for Electric Grid.
- Guide for Proactive Mitigating Distribution System Evoked Woodland Wildfire.



**General Discussion**

None

**Adjourned**

The subcommittee meeting adjourned at 4:10 PM Eastern Time.

**Subcommittee Meeting Attendees**

Manish Patel	Vice-Chair	EPRI
Michael Higginson	Chair	S&C Electric Company
Alla Deronja	Voting Member	American Transmission Company
Melvin Moncey Joseph	Voting Member	Black & Veatch
Subrahmanyam Venkata	Voting Member	Venkata Consulting Solutions Inc.
Brandon Davies	Guest	TRC
Gene Henneberg	Voting Member	NV Energy
Dean Sorensen	Guest	National Grid
Dinesh Gurusinghe	Voting Member	RTDS Technologies Inc.
Charles Sufana	Guest	Retired
Alexander Apostolov	Voting Member	OMICRON electronics
Jason Eruneo	Guest	Duke Energy
Erin Jessup	Guest	Schweitzer Engineering Laboratories
Amin Zamani	Voting Member	GE Renewable Energy
Jorge Cintron Rivera	Guest	US NRC
Mark Mchesney	Guest	Oncor
Jack Jester	Guest	Delmarva Power- Exelon
Michael Meisinger	Voting Member	S&C Electric
Miguel Rios	Voting Member	Southern Company
Genariel Hernandez Quiles	Guest	Quanta Technology
Matthew Black	Voting Member	Sargent & Lundy
Koustubh Banerjee	Guest	Commonwealth Associates, Inc
Dean Ouellette	Voting Member	Quanta Technology
Galina Antonova	Voting Member	Hitachi ABB Powergrids
Daniel Lebeau	Guest	Hydro Quebec
Abel Gonzalez	Guest	Megger
Christopher Walker	Voting Member	Mesa Associates, Inc
James O'Brien	Voting Member	Duke Energy
Ian Tualla	Guest	Duke Energy
Jonathan Sykes	Voting Member	Quanta Technology
Joerg Blumschein	Voting Member	SIEMENS
Michael Kockott	Voting Member	Hitachi ABB Power Grids
Mike Basler	Guest	Basler Electric
Juan Pineros	Guest	Columbia Power System Operator
Muhammad Faisal Hamid	Guest	Black & Veatch
Abu Zahid	Guest	Hydro One Network Inc.

Milo Daub	Guest	MESA Associates
Athula Rajapakse	Guest	University of Manitoba
Ding Lin	Guest	Manitoba Hydro
Kamal Garg	Voting Member	Schweitzer Engineering Laboratories, Inc.
Mital Kanabar	Voting Member	GE
Mukesh Nagpal	Voting Member	BC Hydro
Quintin Verzosa	Voting Member	Doble Engineering
Daniel Sabin	Guest	Schneider Electric
Andre Melo	Guest	Schneider Electric
Arthur Buanno	Guest	FirstEnergy
Robert Kazimier	Voting Member	Bender Inc.
Kevin Malpede	Guest	Com Ed
Yi Hu	Voting Member	Quanta Technology, LLC
Carolina Arbona	Guest	Burns & McDonnell
Greg Hataway	Guest	Burns & McDonnell
Joshua Hughes	Guest	Qualus Power Services
Addis Kifle	Voting Member	Georgia Transmission Corporation
Paras Patel	Guest	TRC Companies Inc.
William English	Guest	Consumers Energy
Chase Lockhart	Guest	Leidos
Brittany Wagner	Guest	Delaware Electric Coop
Joshua Park	Guest	Southern California Edison
Craig Marien	Guest	Eversource Energy
Alexandre Piatniczka	Guest	Schneider Electric
Ajmal Saeed	Guest	Pacific Gas and Electric
Faris Elhaj	Guest	Burns & McDonnell
Daniel Ridenour	Guest	Dominion Energy
Yohann Beaulieu	Guest	HydroQuebec
Lubomir Sevov	Guest	TRC Companies Inc.
Ravindranauth Ramlachan	Guest	GE Vernova

## Working Group Minutes

### C23: Coordination of Synchrophasor Related Activities

Chair: Yi Hu

Vice Chair: Ken Martin

Secretary: N/A

PAR expiration: N/A

Established Date: 16 Oct 2015

Completion Date: N/A

Output: N/A

Draft: N/A

**Assignment:** The ongoing task force will provide three main functions: 1) Liaison with NASPI (North American Synchrophasor Initiative) to keep the PSRC/PSCCC in sync with the changes and needs in the industry with respect to the development and usage of synchronized measurement technology. Formalize transfer process of NASPI task teams developed documents to PES PSRC/PSCCC including making recommendations which NASPI task teams activities should be transferred to IEEE reports, guides and standards. 2) Make recommendations to PSRC/PSCCC for assignments that would require the creation of working groups in PSRC/PSCCC and also recommend what the output of those working groups might be (Guides, reports, etc.) based on the needs of the industry. 3) Coordinate related activities with other IEEE PES committees.

**Meeting Date and Time: Hybrid meeting, On May 13, 2024 at 3:40 pm EDT**

**Attendance:** 3 members out 14 attended. 2 guests also attended.

M or G?	Attended	First Name	Last name	Affiliation
M	In-Person	Yi	Hu	Quanta Technology
M	In-Person	Ken	Martin	EPG
M	In-Person	Jim	O'Brien	Duke Energy
G	In-Person	Manish	Patel	EPRI
G	In-Person	Shane	Haveron	AMETEK

#### Call to order

Officer presiding: Yi Hu, Ken Martin  
Officer recording minutes: Ken Martin

**Quorum was not reached.**

**Call for Patents:** Slides were not shown since the assignment is non-PAR.

**Other IEEE slides:** Guidance slides for copyright and expected attendee behavior were not shown.

**Meeting Agenda:** Agenda was shown.

**Meeting minutes:** 2024 January meeting was emailed to WG members prior to the meeting.

#### Summary of Activities, Discussions, and Action Items

C23 met on Monday, May 13, 2024, at 3:40 p.m. (EST). Attendance was 5 attendees as recorded above.

Yi Hu provided an overview of the WG purpose and recent activity. He introduced the proposal for a task force to assess the need for a POW standard, white paper, or other activity. This was discussed at some length. Attendees worked to develop an assignment for the proposed task force.

Shane described many aspects of such measurements. He suggested Steven Blair as an authority on the topic. He agreed to take on the role as chair of the proposed task force. Yi will make a motion at the C subcommittee for forming such a task force. **(Note: The motion has passed, and the new task force will hold its first meeting at next PSRC/PSCCC meeting).**

- Old Business:
  - None

- New Business:
  - None

Meeting adjourned at 4:50 EDT.

#### **Upcoming PSRC/PSCCC and NASPI Meetings:**

- Next NASPI Work Group Meeting, October 15-16, 2024, Charlotte, NC, USA
- Next WG C23 meeting will be held in conjunction with PSRC/PSCCC meeting, September 9-12, 2024, Scottsdale, AZ, USA

#### **Next Meeting:**

Single session to be held on in conjunction with PSRC/PSCCC 2024 September Meeting. A room for 20 people. HD projector with HDMI connector.

Keep the meeting time on Monday afternoon as it is now.

#### **C29: Power System Testing Methods for Power Swing Blocking and Out of Step Tripping**

**Chair:** Kevin W. Jones

**Vice Chair:** Mike Kockott

**Secretary:** N/A

**Output:** Tutorial

**Established Date:** May 2016

**Expected Completion Date:** May 2024

**Draft:** 1.10

**Assignment:** Create a tutorial on test instructions/parameters to accompany the PSRC documents Application of Out-Of-Step Protection Schemes for Generators, and Tutorial for Setting Impedance Based Power Swing Relaying on Transmission Lines, to aid the users in quality testing of their settings and systems when following the working group outputs which recommend testing of complex relay settings and systems.

Working Group C29 met with 23 attendees on Tuesday, May 14, 2024, 10:40-11:50 AM EDT. There were 3 members and 20 guests. Kevin was unable to attend, so Mike ran the meeting on his behalf.

Following the start of meeting formalities, Mike stated that yet again the writing assignments due for this meeting had not been submitted, and so any go-forward on the tutorial document had essentially stalled.

Abel Gonzalez offered to take on the assignment to complete section 2 and 3. He'll work in collaboration with Michael Wilson and Jun Verzosa who offered their assistance, as well as Christopher Ness who offered his assistance on the testing part. C29 chair / vicechair to ensure Abel and his team have received / have access to the latest draft of the report as well as any other information / material they may need by Friday, May 24. Abel confirmed that end July will be targeted as the date by when he'll complete the work. Mike said that at any time Abel needed to discuss any issue he should immediately raise this to the chair or vicechair.

There was a request to receive a copy of the latest draft of the D29 report. Kevin to distribute to all C29.

With there being no further business Mike thanked all for attending and adjourned the meeting.

AttendanceMembers

Mike Kockott	Hitachi Energy
Jun Verzosa	Doble Engineering
Gene Henneberg	NV Energy

Guests

Jörg Blumschein	Siemens
Kevin Malpede	Com Ed
Ali Hooshyar	University of Toronto
Mukesh Nagpal	Burns & McDonnell
Marilyn Ramirez	Power Engineers
April Underwood	Southern Company
Miguel Rios	Southern Company
Genariel Hernandez	Quanta Technology
Christopher Ness	Megger
Stephen Miller	Energy Emissions Intelligence
Chase Lockhart	Burns & McDonnell
Tom Miller	ITC
Joshua Hughes	Qualus
Sumit Paudyal	Florida International University
Michael Higginson	S&C
Yazid Alkraimeen	Siemens
Sukumar Kamalasan	University of NC, Charlotte
Manish Patel	EPRI
Abel Gonzalez	Megger
Rich Bauer	NERC

**C33: Support for WG-P2004 “Recommended Practice for Hardware-in-the-Loop (HIL) Simulation Based Testing of Electric Power Apparatus and Controls”****Chair:** Dean Ouellette**Vice Chair:** Sakis Meliopoulos**Secretary:** Aaron Findley**Output:** Recommended Practice**Established Date:** September 2018**Expected Completion Date:** 12/30/2023**Draft:** D4**Assignment:** Support the development of this IEEE recommended practice in cooperation with PELS, IAS, and IES efforts

Working group C33 did not meet at this meeting.

**C38: P2030.12 Guide for the Design of Microgrid Protection Systems****Chair:** S. S. (Mani) Venkata**Vice Chair:** Michael Higginson**Secretary:** Geza Joos**Output:** IEEE Guide, P2030.12**Draft:** 1.5**Expected Completion Date:** July 2024**PAR Expiration Date:** December 2024

**Guide Scope**

This guide provides for the design and selection of protective devices and coordination between them for various modes of operation of the microgrid. These include grid connected and islanded modes as transitions between modes.

**Guide Purpose**

To facilitate the deployment of protection systems, given the challenge of protecting equipment and assets in the different modes of operation of the microgrid, including grid connected or islanded modes and during transitions between modes. The guide proposes different approaches, centralized and decentralized, passive and active, to detect and take proper actions to dependably and securely protect the microgrid and its equipment.

**May 14, 2024 Meeting Minutes Hybrid Meeting**

**Officer Presiding:** S. S. (Mani) Venkata

**Minutes Prepared By:** Michael Higginson

This meeting was in-person (Buffalo, NY). The meeting commenced at 8:00 AM EST. There were 25 attendees, with 6 voting members, 2 non-voting members, and 17 non-members. Quorum was not met.

The working group began with introductory remarks by the Chair. The agenda was reviewed. There was no opposition to approval of the agenda.

The IEEE SA patent slides were reviewed, and no concerns or comments were raised. The IEEE copyright and participant slides were reviewed.

Minutes from the January 2024 meeting were reviewed. No comments were raised. Minutes could not be approved because quorum was not met at this meeting. Minutes will be circulated for approval via email.

An update on the status of the Guide development was presented by the Chair and Vice Chair.

Since the last meeting, a recirculation ballot has been conducted. The recirculation had far fewer comments than the initial ballot, with two negative balloters submitting must-be-satisfied comments. Two key comments were discussed and resolved.

- R1-13: the working group agreed to revise the draft to address this comment. The specific verbiage was modified and agreed upon by the working group.
- R1-35: the working group agreed to reject this comment. The existing definition is aligned with our intended meaning.

The remainder of the comments will be resolved and submitted for a recirculation ballot.

Working group business for this meeting has been accomplished. The meeting was adjourned.

Attendees:

Full Name	Affiliation	Status
Abel Gonzalez	Megger	Non-Member
Ajmal Saeed	Pacific Gas & Electric Company	Non-Member

Alexandre Piatniczka	Schneider Electric	Non-Member
Amin Zamani	Quanta Technology	Voting Member
April Underwood	Southern Company	Non-Member
Chip Christmann	Basler Electric	Non-Member
Christopher Ness	Megger	Non-Member
Dean Sorensen	National Grid	Non-Member
Fredy Bravo	Duke Energy	Non-Member
Genariel Hernandez	Quanta Technology	Non-Member
Juan Gers	Gers USA	Non-Member
Kamal Garg	SEL	Non-Voting Member
Malia Zaman	IEEE	Non-Member
Matthew Reno	Sandia National Labs	Voting Member
Michael Higginson	S&C	Vice-Chair
Miguel Rios	Southern Company	Non-Member
Mike Basler	Basler Electric	Non-Member
Nestor Casilla	Doble	Non-Member
Randy Hamilton	Basler Electric Co	Non-Voting Member
Ratan Das	GE Energy Consulting	Voting Member
S.S. (Mani) Venkata	Venkata Consulting Solutions	Chair
Souvik Chandra	Eaton	Non-Member
Stephen Miller	Energy Emissions Intelligence	Non-Member
Sukumar Kamalasadana	UNC Charlotte	Voting Member
Sumit Paudyal	Florida International University	Non-Member

### **C39: IEEE PC37.252 Guide for Testing Automatic Voltage Control Systems in Regional Power Grids**

**Chair:** Xiaopeng Li

**Vice Chair:** None

**Secretary:** Kai Liao

**Output:** Guide

**Established Date:** February 2019

**Expected Completion Date:** May 2024

**Draft:** 5.0.

**Assignment:** Develop a guide for testing automatic voltage control systems in regional power grids.

Working group C39 did not meet at this meeting.

### **C40: Prepare a tutorial from the work of C37.247 Standard for Phasor Data Concentrators**

**Chair:** Vasudev Gharpure

**Vice Chair:** Mital Kanabar

**Secretary:** Mital Kanabar

**Output:** Tutorial planned (Paper, Presentation in future)

**Established Date:** January 2020

**Expected Completion Date:** December 2022

**Draft:** 1.01

**Assignment:** Develop a publication (transaction and/or conference), a tutorial and a presentation based on C37.247-2019: the standard for Phasor Data Concentrators for power systems.

Working group C40 did not meet at this meeting.

**C41: Performance requirements for Distribution PMUs****Chair: K. Martin****Vice Chair: N. Perera****Secretary: D. Gurusinghe****Output:** Report**Established Date:** January 2021**Expected Completion Date:** May 2025**Draft:** 1.0\_2may

**Assignment:** WG C41 will prepare a technical report on the measurement performance needs and requirements for PMUs that are intended for use in distribution systems. This will include examination of the measurement environment, detailing the data requirements of phasor-based distribution applications, and supporting liaisons with other groups working with synchrophasors in the distribution environment including other IEEE TC's, NASPI, NERC, and IEC.

Working Group C41 met on Tuesday, May 14, 2024, at 8:00 a.m. (EST) with 2 members and 6 guests. Ken Martin (Chair) welcomed participants and briefed the WG's objective, described in the assignment above. A quorum was not achieved, and the previous minutes were not approved.

Ken provided background information and the latest updates on the WG activities. Currently, our focus lies on distribution applications, with the aim of identifying their characteristics and data requirements to make appropriate recommendations.

Ken noted that the current synchrophasor standard lacks specific accuracy classes, containing only P- and M- classes. He noted that introducing classes such as 0.1 and 0.2 classes for improved granularity has been discussed.

Additionally, Ken mentioned that IEC TC 95 has received a proposal for a distribution PMU standard. The WG reviewed the proposal to consider its similarity with the C41 activity. Deepak observed that the proposal appears more like a paper, discussing synchrophasor systems rather than focusing on synchrophasor techniques, as indicated by its title. Yi observed that the proposal also included recording point-on-wave which is usually not included in synchrophasor standards. Ken noted that the proposal included a communication aspect, something that is usually handled in a different TC (TC57).

Ken went through a distribution PMU application group, titled 'Enhanced Reliability and Resilience Analysis.' The noted requirements are from the applications report and still need to be considered by the WG. Deepak and Athula agreed to review the current version of the report.

Ken mentioned that our next meeting will be face-to-face after the IEEE SGSMA (Smart Grid Synchronized Measurements and Analytics) meeting on May 20-24, 2024, in Washington DC. This meeting was previously announced to the WG.

Recorded by Dinesh Gurusinghe.

#	Attendee	Affiliation	M/G
1.	Ken Martin	EPG	C



2.	Dinesh Gurusinghe	RTDS	S
3.	Milo Daub	MESA Association	G
4.	Manish Patel	EPRI	G
5.	Evangelos Farantatos	EPRI	G
6.	Athula Rajapakse	UofM	G
7.	Deepak Maragal	LNDTS	G
8.	Yi Hu	Quanta Technology	G

### **C43: Artificial Intelligence and Machine Learning technologies for power system protection and control applications**

**Chair:** Yi Hu

**Vice Chair:** Adi Mulawarman

**Secretary:** Carolina Arbona

**PAR expiration:** N/A

**Established:** January 2021

**Completion:** December 2026

**Output:** N/A

**Draft:** N/A

**C43 Assignment:** Revise the report on applications of Artificial Intelligence and Machine Learning technologies for power system protection and control to include latest advancements and findings.

**Meeting Date and Time:** In-person meeting with a WebEx, On May 15, 2024 at 10:40 AM EDT

**Meeting Location:** Hyatt Regency Buffalo/Hotel Conference Center, 2 Fountain Plaza, Buffalo, NY, USA

**Attendance:** 24 (6 virtual) out of 41 members and 20 guests attended.

M or G?	Attended	First Name	Last Name	Affiliation
M	In-person	Yi	Hu	Quanta Technology
M	In-person	Adi	Mulawarman	Xcel
M	In-person	Carolina	Arbona	Burns&McDonnell
M	In-person	Alex	Apostolov	Omicron
M	In-person	Abel	Gonzalez	Megger
M	In-person	Genariel	Hernández	Quanta Technology
M	In-person	Michael	Higginson	S&C
M	In-person	Ted	Hlibka	Retired
M	In-person	Melvin Moncey	Joseph	Burns&McDonnell
M	In-person	Sukumar	Kamalasadan	UNC Charlotte
M	In-person	Mital	Kanabar	GE Vernova
M	In-person	Juan	Pineros	XM -Columbia
M	In-person	Athula	Rajapakse	U. of Manitoba
M	In-person	Miguel	Rios	Southern Company
M	In-person	Dan	Sabin	Schneider Electric
M	In-person	Jonathan	Sykes	Quanta Technology
M	In-person	Justin	Turner	GE
M	Virtual	Ali	Bidram	U. of New Mexico
M	Virtual	Robert	Fowler	ENTRUST Solutions
M	Virtual	Ramakrishna (Rama)	Gokaraju	U. of Saskatchewan
M	Virtual	Vahid	Madani	Gridtology
M	Virtual	Anthony	Montoya	KBR/DOE
M	Virtual	Jayaprakash	Ponraj	TRANSCO

M or G?	Attended	First Name	Last Name	Affiliation
G	In-person	Mark	Adamiak	(on file)
G	In-person	Yazid	Alkraimeen	Siemens Ind.
G	In-person	Yohann	Beaulieu	Hydro Quebec
G	In-person	Fredy	Bravo	Duke Energy
G	In-person	Sovik	Chandra	EATON Corp.
G	In-person	Sureth	Chanarasappa	Westinhouse Electric
G	In-person	Jorge	A. Cintron Rivera	NRC
G	In-person	Ratan	Das	GE Vernova
G	In-person	Brandon	Davies	TRC
G	In-person	Milo	Daub	Mesa Assoc.
G	In-person	Mat	Garver	Beckwith
G	In-person	Greg	Hataway	Burns&McDonnell
G	In-person	Addis	Kifle	GTC
G	In-person	Tapan	Manna	Burns&McDonnell
G	In-person	Craig	Marien	Eversource
G	In-person	Jashua	Park	SCE
G	In-person	Paras	Patel	TRC
G	In-person	Alexandre	Piatniczka	Schneider Electric
G	In-person	Priya	Raghuraman	Siemens Industry
G	In-person	Jose	Ruiz	Doble
G	In-person	April	Underwood	Southern Company Services

**Call to order: 10:40 AM EDT**

Officer presiding: Yi Hu, Adi Mulawarman, Carolina Arbona

Officer recording minutes: Adi Mulawarman

**Quorum was reached.**

**Call for Patents:** Slides were not shown since the assignment is non-PAR.

**Other IEEE slides:** Guidance slides for copyright policy and expected IEEE meeting attendee behavior were shown at this meeting.

**Meeting Agenda:** Agenda was shown.

**Meeting minutes:** January 2024 meeting minutes emailed to WG members prior to this meeting.

**Summary of Activities, Discussions, and Action Items**

- Non-PAR Slides shown.
- Approval of last meeting minutes – done
- Introduction, 38 in person, 6 online. Total 44. In the room, 18 are indicated as members with 6 online participating members.
- Discussion:
  - Existing report available from PES Resource Center: Look for TR112.
  - Dan Sabin's WG is working on a report focuses on the data set; please join that WG if interested.
- Carolina (new WG secretary) presenting.
  - Focus on what protection and control need.
  - Possible spin-offs to the new working group
    - Practical considerations (target to beginner)

- Practical applications (target beyond beginners who want to know examples of practical apps)
  - Reference to the markup version with different highlights on what the split/break is on the existing report. (green practical considerations, pink practical applications).
  - Suggested by Mital K. regarding regulation., concern with CIP type data.
  - Alex A., comment on the requirement for data anonymity limit.
  - Mike Higginson, comment on the assignment is not to create 2 reports. The assignment currently is revision. If it is going to change to 2 reports we need to bring up to SC for approval to change.
  - Biweekly calls will be set up. We will send out a poll to determine the best time to get this set up.
- Presentation from Ted Hlibka. A copy of the ppt is available.
  - On reinforcement Learning Model for Reactive Power Control
  - Accounting for TR tap position, load flow, cap bank status, etc.
  - 14 bus example.
  - Determine the optimal policy for load flow (Gen) based on different combinations of tap pos of all 3 transformers and cap bank positions.
  - Modified Q learning algorithm to improve convergence time

The meeting attendees were informed for the following item/action:

- WG Chair is working with PAC World Magazine on a summary article (<3,000 words) of the report for PAC World Magazine June 2024 issue. Will notify WG members and guests when it is published.

**Meeting adjourned at 11:50 AM EDST.**

**Next meeting:**

- Double-session to be held in conjunction with PSRC/PSCCC meeting in September 2024, Scottsdale, AZ, USA.
- A room for 40 people.
- HD projector with HDMI connector.

Avoid overlap with following sessions:

- **PSRC:** C23, C41, C45, D42, D47, H54, and PSRC B2/PSCC A2TF.
- **PSCCC:** P9 and P10.

**C44: Summary Paper on the Modification of Commercial Fault Calculation Programs for Wind Turbine Generators**

**Chair:** Sukumar Brahma (Clemson University)

**Vice Chair:** Evangelos Farantatos (EPRI)

**Secretary:** N/A

**Output:** Summary Paper

**Established Date:** September 2021

**Expected Completion Date:** May 2024

**Draft:** 10.0

**Assignment:** Prepare a Summary Paper Based on the Contents of the Report Prepared by the C24 WG "Modification of Commercial Fault Calculation Programs for Wind Turbine Generators"

Working group C44 did not meet at this meeting.

**C45: Protection and short-circuit modeling of systems with high penetration of inverter based resources**

**Chair:** Ali Hooshyar

**Vice Chair:** Manish Patel

**Secretary:** Ritwik Chowdhury

**Output:** Report

**Draft:** 1.1

**Established Date:** May 2021

**Expected Completion Date:** 2025

**Assignment:** To prepare a technical report to investigate short-circuit modeling and protection of systems with high penetration of IBRs as a continuation of the works of WGs C32 and C24.

The working group quorum was not met.

Ratan provided a presentation on GEV Type III WTG Modeling for use in Conventional Short-circuit programs (<https://psrc.sharefile.com/public/share/web-s9565bb33d817494f91aa359ef1bdf515>).

There were few follow-up questions from the attendees:

- There was a question about an assumption of linearization in the results. The presenter mentioned that the Option 2 using the VCCS model can be helpful when addressed. However, no short-circuit programs currently support the entire VCCS.
- There was a question about how the results were verified. There was a method called container testing to verify the models.
- There was a comment that it may be misleading to represent that the negative-sequence impedance is inductive in nature. The presenter clarified that the Type III WTG has a significant resistive component in the negative-sequence impedance, as described in the presentation, unlike a synchronous generator.
- The presenter was opposed to providing the VCCS table as dll files because they are very specific to the short-circuit programs. The presenter was more in favor of providing the VCCS table, either in Excel or in Text format, and the short-circuit program provider could convert it to other formats for their own program. Both Excel and Text files provide better transparency.

Ali provided a presentation on Power Swing in Systems with Inverter-Based Resources

(<https://psrc.sharefile.com/public/share/web-s73a258f0f06244b4acc436e580d982b2>). There were

few follow-up questions from the attendees:

- How was the SCR for this model. The SCR was 5.5 or so for the model.
- There was a question about whether there is need of Distance Zone 1 to trip high-speed or whether communications-assisted schemes, such as line current differential, would be a better alternative.
- There was a question about the parameter definitions. Kint, Kprp, and Cdc were defined as controller integral gain, controller proportional gain, and dc capacitor value, respectively.
- How was the power recovery process of the IBR modeled?

An attendee spoke about the need to go through the draft document in its entirety.

The meeting adjourned at 3:32 PM EDT.

## Meeting Participants:

<b>First Name</b>	<b>Last Name</b>	<b>Affiliation</b>	<b>Role</b>
Ali	Hooshyar	University of Toronto	C
Manish	Patel	EPRI	VC
Ritwik	Chowdhury	SEL	S
Adi	Mulawarman	Xcel Energy	M
Mukesh	Nagpal	Burns & McDonnell	M
Brandon	Davies	TRC	G
Ratan	Das	GE Vernova	M
Evangelos	Farantatos	EPRI	M
Rich	Bauer	NERC	M
Amin	Zamani	Quanta Technologies	M
Tom	Miller	ITC	M
Stephen	Miller	Energy Emissions Intelligence	M
Sebastien	Billaut	Commonwealth Associates	M
Daniel	Ridenour	Dominion Energy	G
Matthew	Reno	Sandia	M
Yazid	Alkraimeen	Siemens	M
Kamal	Garg	SEL	M
Sukumar	Kamalasadan	UNC Charlotte	M
Yi	Hu	Quanta Technologies	G
Jonathan	Sykes	Quanta Technologies	G
Miguel	Rios	Southern Company Services	G
Stephen	Conrad	Retired	G
Genariel	Hernandez	Quanta Technologies	NVM
Addis	Kifle	GTC	G
Carolina	Arbona	Burns & McDonnell	G
Chase	Lockhart	Burns & McDonnell	NVM
Abel	Gonzalez	Megger	G
Paras	Patel	TRC	G
Mark	McChesney	Oncor	G
Ajmal	Saeed	PG&E	NVM
Koustubh	Banerjee	Eversource Energy	NVM
Fredy	Bravo	Duke Energy	G
Milo	Daub	Mesa Associates	G
Mike	Basler	Basler	G
Greg	Hataway	Burns & McDonnell	G
Pratap	Mysore	Ulteig	G
Jorg	Blumschein	Siemens	G
Nestor	Casilla	Doble Engineering	G
Michelle	Haines	Burns & McDonnell	G
Juan	Pineros	XM Columbia Power System	G
Claire	Patti	Portland General	G
Timothy	Erwin	GE Vernova	G
Kevin	Malpede	ComEd	G

Andy	Kunze	MN Power	G
Souvik	Chandra	Eaton Corp	G
Kenny	Sheffler	SEL ES	G
Jack	Jester	Exelon Corp	G
Faris	Elhaj	Burns & McDonnell	G

\*M = Voting Member, NVM = Non-voting Member, G = Non-member/Guest, C = Chair, VC = Vice Chair, S = Secretary

**C46: Summary paper on C37.242: Guide for Synchronization, Calibration, Testing, and Installation of Phasor Measurement Units (PMUs) for Power System Protection and Control**

**Chair:** Allen Goldstein

**Vice Chair:** Deepak Maragal

**Secretary:** N/A

**Output:** Summary Paper

**PAR and PAR expiration:** N/A

**Established Date:** 05/04/2021

**Expected Completion Date:** Sept 2023

**Draft:** 4.1

**Assignment: Drafting of a summary paper of C37.242**

Working group C46 did not meet at this meeting.

**CTF47: Relay Modeling in Electromechanical Dynamic Simulations**

**Chair:** Evangelos Farantatos (EPRI)

**Vice Chair:** Mohammad Zadeh (ETAP)

**Secretary:** N/A

**Output:** N/A

**Established Date:** January 2022

**Expected Completion Date:** January 2025

**Draft:** 1.0

**Assignment:** Contribute to the report of the Power System Dynamic Performance (PSDP) committee TF “Integrating Relay Models with RMS Dynamic Simulations”.

CTF47 met on Tuesday May 14, 2024, at 13:00 EDT with 18 attendees.

Chair, Evangelos presided over the meeting. He brought the meeting to order and showed the agenda.

First, the scope of the taskforce (TF) was reviewed. Then, it was announced that a draft report shared by the PSDP TF chair has been uploaded on PSRC’s ShareFile and a link has been created and was sent to the CTF47 roster in April.

During the remaining time of the meeting, the chair went through the draft report with the attendees and discussed the sections of the report. The ShareFile link will be sent to the updated CTF47 roster in May, and volunteers are expected to be identified to review the existing sections of the report and/or add new sections. Since the PSDP TF will be meeting in July during the PESGM24 in Seattle, a first round of review will be attempted by then.

For the next meeting, we will need a projector and a room for 20.

Please avoid conflict with C38, C44, C45, C50, CTF51, B10, K29, D44, H45.

Attendees:

First Name	Last Name	Affiliation
Evangelos	Farantatos	EPRI
Jeysson	Gonzalez	S&C Electric
Mark	McChesney	Oncor
Yi	Hu	Quanta Technology
Yazid	Alkraimeen	Siemens Industry
Miguel	Rios	Southern Company
Nestor	Casilla	Doble
Amin	Zamani	Quanta Technology
Abel	Gonzalez	Megger
Mike	Meisinger	S&C Electric
Gene	Henneberg	NV Energy
Michael	Higginson	S&C Electric
Sakis	Meliopoulos	Georgia Tech
Mike	Basler	Basler Electric
Genariel	Hernandez	Quanta Technology
Chase	Lockhart	Burns & McDonnell
Paul	Harris	PacifiCorp
Athula	Rajapakse	University of Manitoba

**C48: Summary paper of C37.120 IEEE Guide for Protection System Redundancy for Power System Reliability**

**Chair:** Alla Deronja

**Vice Chair/Secretary:** Melvin Moncey Joseph

**Output:** Conference paper

**Established Date:** May 2022

**Expected Completion:** December 2025

**Draft:** 1

**Assignment:** Write a conference/IEEE Transactions papers for C37.120 IEEE Guide for Protection System Redundancy for Power System Reliability.

WG C48 met on Tuesday, May 14, 2024, in a single session with 9 members and 9 guests attending. Two guests joined the WG as members.

The JTCM 2024 January 10 WG meeting minutes were approved. Motion: Kevin Donahoe, 2<sup>nd</sup>: Don Ware.

The guide's summary paper was presented at the Texas A&M 2024 relay conference. It was accepted by the WPRC 2024, and we are waiting on the reply from 2024 MIPSYCON.

The WG is now focused on writing an IEEE Transactions paper to increase the visibility of the new guide and promote greater insight into the guide's development.

At the meeting, the WG reviewed and updated the outline for the future paper. It was stated that the new paper needs to contain 40-60% of the new material that was not in the summary paper. This material should be of a research nature and aimed to provide an insight to the background on the material included in the guide.

The WG agreed to not include some parts of the summary paper in the transactions paper. Clause 5 was changed to discuss protection function-based redundancy vs. equipment protection redundancy.

The paper will include more topics on how the WG that developed the guide had come to conclusions to include or exclude material in the guide, thus, focusing on how the guide was developed. Hence, the new title for the paper was suggested.

The summary paper is posted on the Texas A&M conference site but was not entered into the IEEE database. There may be a copyright issue for the new transactions paper that needs to be verified.

A meeting participant asked how the new paper will reflect the NERC TPL-001-5.1 reliability standard that requires redundancy for every element of the protection system. It was explained that the regulatory standards are commonly not referenced nor mentioned in the IEEE documents. They document regulatory requirements while the IEEE documents provide detailed technical principles that can be used to meet those regulatory requirements.

The assignments distributed for writeups of the additional topics at the January meeting have all been received and incorporated in the paper but not reviewed yet. An additional assignment was made at this meeting.

For the next meeting, we request a room for 20-25 people, single session, with a computer projector.

Please avoid conflicts with D42, D47, D37, K31, C52, and I2.

#### Meeting Attendees

Role	First Name	Last Name	Affiliation
Guest	Jim	O'Brien	Duke Energy
Guest	Angelo	Tempone	Duke Energy
Member	Kevin	Malpede	ComEd
Member	Kevin	Donahoe	GE Renewable
Member	Addis	Kifle	Georgia Transmission
Member	Craig	Palmer	PowerComm Solutions
Member	Manish	Patel	EPRI
Member	Juan	Piñeros - XM	XM SA ESP



Member	Don	Ware	Power Grid Engineering
Member/Chair	Alla	Deronja	ATC
Member/Vice-chair	Melvin	Moncey Joseph	Burns & McDonell
Guest	Paras	Patel	TRC
Guest	Galina	Antonova	Hitachi Energy
Guest	Carolyn	Sun	Black & Veatch
Guest	Ding	Lin	Manitoba Hydro
Guest	Steve	Blair	Synaptec
Guest	Dave	Dolezilek	SEL
Guest	Ritwik	Chowdhury	SEL

### **C50: Protection of Inverter-Based Resources**

**Chair:** Brandon Davies

**Vice Chair:** Amin Zamani

**Output:** Report

**Established Date:** September 2022

**Expected Completion Date:** January 2025

**Draft:** 0

**Assignment:** Revise and expand PES Technical Report “PES-TR87: Protection of Wind Electric Plants” to explicitly address protection of other IBR Plants (e.g., Solar PV Systems and Battery Energy Storage Systems).

The WG met (in person) on May 15, 2024, at 09:10–10:30AM EST. There was a total of 33 attendees in the meeting (6 members and 27 guests).

### **Meeting Agenda**

- Introductions
- Report status update
- Review of assignment and proposed modifications
- General discussion
- Adjourn

### **Summary of Meeting Discussion**

- The meeting started with the introduction of attendees (7 members and 26 guesses attended).
- The Chair explained that one of the goals of this meeting is to set up a timeline for creating the first draft; the membership requirements were also discussed.
- The Chair provided an update on the status of the report (Draft 1.2) and the assignments provided. Assignments are due Friday – June 28, 2024. The new draft will be posted on share drive.
- Assignments to be shared by Chair and/or Vice-chair. There are sections with no comment/contribution (2.8, 3.1.5, and Appendix A).
- The importance of harmonic/sub-harmonic section was discussed. It was discussed to clarify the applicability of SSR/SSCI to IBR type.
- It was discussed that SSR/SSCI has a control solution, but it would be good for a protection

engineer to understand the potential impact on their protection system.

- Ritwik volunteered to review Section 2.8 (harmonic/sub-harmonic section). There is an AMPS report on SSR/SSCI (to be cited), and IEEE Std. 519.1 is working on impacts of IBR harmonics on system power quality.
- Michelle Haines volunteer to Review Arc Flash section (3.1.5).
- Paras Patel volunteered to review Appendix A (directional Phase OC settings). Amin will discuss with Mohammad Zadeh if he is also willing to update this section (as Mohammad was the main contributor in the original report).
- Chair discussed the plan for the next step and shared a proposed timeline for drafting the report. The target date is May 2025 for final comment resolution and to submit the report to subcommittee for approval.
- TIR number to be discussed in the next meeting (new number or revision to TR 87).  
For next meeting, we request a room for 30 people with a projector. Please avoid conflicts with C45, D43, K31, and D45.

Attendees:

<b>Name</b>	<b>Employer</b>	<b>Membership</b>	<b>Sign-in</b>
Addis Kifle	GTC	G	X
Adi Mulawarman	Xcel Energy	G	X
Amin Zamani	Quanta Technology	VM	X
April Underwood	Southern Company	VM	X
Brandon Davies		VM	X
Carolyn Sun	Black & Veatch	VM	X
Christopher Ness	Megger	G	X
Evangelos Farantatos	EPRI	G	X
Genariel Hernandez	Quanta Technology	G	X
Gene Henneberg	NV Energy	G	X
Jason Buneo		G	X
Jason Eruneo		VM	X
Joshua Park	So. Cal. Edison	G	X
Juan Piñeros - XM		G	X
Manish Patel	EPRI	VM	X
Mark McChesney	Oncor	G	X
Matthew Reno	Sandia National Lab	VM	X
Michael Higginson	S&C	G	X
Michelle Haines	Burns and McDonald	G	X
Miguel Rios	Southern Company	G	X
Milodaub	Mesa Associates	G	X
Muhammad Hamid	Black & Veach	G	X
Mukesh Nagpal	Burns and McDonald	G	X
Nuwan Perera	POWER Engineers, Inc.	G	X

Paras Patel	TRC COMPANIES INC	VM	X
Ratan Das		G	X
Rich Bauer	NERC	G	X
Ritwik Chowdhury	SEL	NVM	X
Scott Elling	Burns and McDonald	G	X
Steven Muller	Ameren	G	X
Sukumar Kamalasan	UNCC	G	X
Tapan Manna	Burns and McDonald	G	X
Yazid Alkraimeen	Siemens	G	X
Yi Hu	Quanta Technology	G	X

**C51: Prepare a technical report on underfrequency excursion mitigation strategies for changing generation resource mixes in the bulk power system**

**Chair:** Kevin W. Jones

**Vice Chair:** Chase Lockhart

**Secretary:** N/A

**Output:** Technical Report

**Established Date:** January 2023

**Expected Completion Date:** TBD

**Draft:** TBD

**Assignment:** Prepare a technical report on underfrequency excursion mitigation strategies for changing generation resource mixes in the bulk power system.

**Location:** Hyatt Regency Buffalo, NY

**Date:** May 14, 2024

**Time:** 9:20am – 10:30am EST

C51 held the first meeting as a WG with 21 people in attendance, led by the vice chair. The meeting started with introductions in the room. A call for patents was made and the IEEE slides were displayed. Reviewed minutes from the last meeting. The goal of the meeting was to develop a draft title for the technical report as well as a rough outline for the report. After an open discussion in the room, the working draft title settled on, for now, was “Underfrequency mitigation strategies for low inertia systems”. The group then discussed a multitude of topics to include in the report that could be classified into 3 large buckets. These buckets were Prevention, Detection, and Response. The Vice-Chair took detailed notes of the open discussion and will review them with the chair before the next meeting to continue making progress.

The Vice-Chair thanked everyone who attended the meeting.

Requirements for the next WG meeting: A projector and a room for approximately 30 people.

Attendees:

First	Last	Affiliation	Status
Chase	Lockhart	1898 and Co. Part of Burns and McDonnell	Vice Chair
Michael	Higginson	S&C Electric Co	Member
Mike	Kockott	Hitachi Energy	Guest
Chip	Christmann	Basler	Guest

Dean	Sorensen	National Grid	Guest
Kevin	Malpede	ComEd	Guest
Brittany	Wagner	Delaware Electric Co.	Guest
Manish	Patel	EPRI	Guest
Craig	Marien	Eversource	Guest
Evangelos	Farantatos	EPRI	Guest
Marilyn	Ramirez	Power Engineers	Guest
Miguel	Rios	SOCO	Guest
April	Underwood	SOCO	Guest
Kenny	Sheefler	SEL	Guest
Yazid	Alkraimeen	Siemens	Guest
Matthew	Reno	Sandia Labs	Guest
Abel	Gonzalex	Megger	Guest
Art	Buanno	First Energy	Guest
Christopher	Ness	Megger	Guest
Athula	Rajapakse	University of Manitoba	Guest
Jim	O'Brien	Duke Energy	Guest

### **C52: Revise IEEE Std C37.246-2017, IEEE Guide for Protection Systems of Transmission – to – Generation Interconnections**

**Chair:** Melvin Moncey Joseph

**Vice Chair:** Mike Jensen

**Secretary:** Muhammad Hamid

**Output:** Guide

**Established Date:** 01/09/2024

**Expected Completion Date:** 2027

**Draft:** TBD

**Assignment:** Revise standard C37.246, IEEE Guide for Protection Systems of Transmission-to-Generation Interconnections

### **Minutes for the 05/14/2024 meeting from 3:40 to 4:50 PM EDT**

- a) Officers presiding – Melvin Moncey Joseph, Mike Jensen, and Muhammad Hamid
- b) Officer recording minutes – Muhammad Hamid
- c) Call to order – Melvin Moncey Joseph
- d) Chair's remarks – Copyright, patent and behavior slides presented. No issues identified.
- e) Quorum Check – Meeting did not meet Quorum.
- f) Summary of discussions and conclusions including any motions.
  - a. PAR has been approved for the WG and expires in 2029.
    - i. Chair shared the "About the Guide" slides showing the approved scope and purpose.
    - ii. Chair showed the timeline and the shared the meeting cadence he would like to follow.
    - iii. Immeet central for the working group has been set up and is ready.
- g) Volunteers & Action Items:
  - a. Section 4 Review: Sudarshan, Michelle Haines, Faris Elhaj, Joshua Park
  - b. Section 5 Review: Melvin, Muhammad, Fred Agyekum, and Ian Tualla
  - c. Section 6 Review: Ajmal, Paras Patel, Melvin, Joshua Park, and Chase Lockhart
  - d. Section 7 Review:

- i. 7.1-7.6: Addis Kifle, Lubomir, Faris Elhaj, Libin Varghese
  - ii. 7.6: Manish Patel
  - iii. 7.7: Craig Palmer
  - iv. 7.9: Joshua Park, Paras Patel, Manish Patel, Fred
  - v. 7.10: Joshua Park
  - vi. 7.7-7.10: Milo Daub, Mike Jensen
- h) Chair will distribute the instructions sheets with the deadline of Aug 15 for completing the reviews.
- i) The plan is to start assignment reviews from the next meeting.
- j) Recess and time of final adjournment: Adjourned by Melvin at 4:50 PM EDT.
- k) **Attendance:** 25 Attendees – 12 Members, 13 Guests
- l) Next meeting date and location at: September 2024 in Scottsdale, AZ at PSRC/PSCC Meeting. For next meeting, we request a room for 40 people with a projector. Please avoid conflicts with B3, B5, C45, C48, C50, D37, D42, D53, J17, K27, I49/P21

**MEETING PARTICIPANTS MAY 2024:**

No.	NAME	AFFILIATION	ROLE
1	Melvin Moncey Joseph	Burns & McDonnell	Chair
2	Mike Jensen	PG&E	Vice Chair
3	Muhammad Hamid	Black & Veatch	Secretary
4	Milo Daub	Mesa Associates	Member
5	Sudarshan Byreddy	Burns & McDonnell	Member
6	Joshua Park	SCE	Member
7	Fred Agyekum	SEL	Member
8	Addis Kifle	GTC	Member
9	Ian Tualla	Duke Energy	Member
10	Michael Higginson	S&C	Member
11	Ajmal Saeed	PG&E	Member
12	Manish Patel	EPRI	Member
13	Chase Lockhart	Burns & McDonnell	Member
14	Daniel Lebeau	Hydro-Quebec	Member
15	Paras Patel	TRC	Member
16	Faris Elhaj	Burns & McDonnell	Member
17	Lubomir Sevov	TRC	Member
18	Libin Varghese	NYPA	Member
19	Michelle Haines	Burns & McDonnell	Member
20	Craig Palmer	PowerComm	Member
21	Alla Deronja	ATC	Guest
22	Gene Henneberg	NV Energy	Guest
23	Andrew Nguyen	TVA	Guest
24	Malia Zaman	IEEE SA	Guest
25	Kevin Donahoe	GE Vernova	Guest

**C53: Artificial Intelligence / Machine Learning (AI/ML) Data Collection Working Group**

**Chair:** Dan Sabin

**Vice Chair:** Matthew Reno

**Secretary:** Megha Kamal

**Output:** Develop a Technical Report

**Established Date:** January 2024

**Expected Completion Date:** TBD

**Draft:** TBD

**Assignment:** Develop an IEEE PES technical report summarizing the collection, management, and analysis of protection & control data sets for artificial intelligence and machine learning applications.

**Call to Order:** The second meeting to write an AI/ML Data Collection Working Group meeting convened at 8:01 AM with 20 attendees, 10 of which were working group members, which established quorum. Meeting minutes were recorded by Megha Kamal.

### Meeting Discussion

Working Group Chair Dan Sabin Welcomed everyone and started with Copyright Policy and C53 Working Group Overview. This is focused on collection of data set, rather than use cases. As Use Cases have different Task Force Group.

Technical Presentation: Overview of Available Online Data Sets by Matt Reno, Sandia National Labs. Vice Chair Matt presented some of the online available dataset. However, some of the website/data links were not available at the time.

Draft Report Outline: The Report Outline will include the available and up-to-date online dataset repository/location. Data asset owner should upload a detailed information on the dataset, including, correct labels, data source, measurement location, grounding information, system topology, age of the data and voltage levels, etc. along with data set.

The Report should also include a general guidance and recommendation on uploading and using the dataset. For example, to prevent false alarm, we need normal data as well, besides fault occurrence data. As otherwise the model biases largely to faults. System grounding also has a huge impact on event signature. Transmission and Distribution data should not merge. Report also needs to have a section to where the dataset should be stayed/uploaded permanently for future use.

Dataset should need to be tied with appropriate use cases. *Jeff Wischkaemper* agreed to volunteer on Report outlining and the guidance, recommendation, and warnings regarding appropriate data set.

Open Discussion: There were few more sources of dataset brought up, including, OEDI, GESL, Fnet, IEEE Dataport, RTDMS repository, EPG company website, dataset from PQSoft, etc.

Next Steps: Jeff Wischkaemper will work on Report outlining and the guidance, recommendation, and warnings regarding appropriate data set. If anyone find any new link/sources of data, you can email it to Matt Reno at [mjreno@sandia.gov](mailto:mjreno@sandia.gov).

**Adjournment:** The meeting adjourned at 9:10 AM.

### Attendees:

First Name	Last Name	Company

Joe	Grappé	Sentient Energy
Muhammad	Hamid	Black & Veatch
Genariel	Hernandez	Quanta Technology
Yi	Hu	Quanta Technology
Mohasinina	Kamal	SCE
Matthew	Reno	Sandia National Laboratories
Miguel	Rios	Southern Company
Jose	Ruiz	Doble
Jeff	Wischkaemper	Texas A&M
Deepak	Maragal	LND Technical Services
Daniel	Sabin	Schneider Electric
Melvin Moncey	Joseph	Burns & McDonnell
Jeysson	Gonzales	S&C Electric
Michael	Higginson	S&C Electric
Alexandre	Piatniczka	Schneider Electric
Yohann	Beaulieu	Hydro-Québec
Adi	Mulawaraman	Xcel Energy
Athula	Rajapakse	University of Manitoba
Mark	McChesney	Oncor Electric Delivery
Milo	Vaub	Mesa Associates

#### **CTF54: Data Centers Protection, Automation, and Control (PAC) Systems**

**Chair:** André Melo (andre.melo@se.com)

**Vice Chair:** TBD

**Secretary:** TBD

**Output:** Recommendation to C-SC

**Established Date:** May 2024

**Expected Completion Date:** TBD

**Draft:** NA

**Assignment:** Investigate the need for a new standard or technical report to define the architecture and functional requirements of Protection, Automation, and Control (PAC) Systems for Data Centers including Electrical Power Monitoring System (EPMS) integration.

#### **Assignment introduction and discussions**

- a) Term Definitions;
- b) Classification of Electrical Topologies;
- c) Classification and Functional Requirements of Protection Schemes;
- d) Classification and Functional Requirements of System Architectures;
- e) Considerations based on network management and communication protocols;
- f) New Applications Schemes Proposals (CPC, Virtualization)

Discussion about the scope and the adoption of existing standards for the context Suggestion of joint work with T&D Power Quality committee or Smart Building and Loads Committee.

Agreed on monthly virtual meetings for industry presentations. First presenter is defined, but date to be confirmed.

Agreed to meet again in September as a Task Force to finalize the scope and decide on a Technical Report or Standard.

**Next Meeting:** The CTF54 will meet in person at the IEEE PES PSRC/PSCC Committee Meetings in Scottsdale, AZ on September 9, 2024.

**Adjournment:** The meeting adjourned at 3:30 PM.

**Attendee List:** The following 15 people attended the meeting.

<b>Name</b>	<b>Last Name</b>	<b>Company</b>
April	Underwood	Southern Company
Justin	Turner	GE Vernova
Ravindranauth	Ramlachan	GE Vernova
Yohann	Beaulieu	Hydro-Quebec
Erin	Jessup	SEL
Deepak	Maragal	LNDTS
Fred	Agyekum	SEL
Priya	Raghuraman	Siemens
Alexandre	Pratniczka	Schneider Electric
Todd	Martin	BASLER
Dan	Sabin	Schneider Electric
Kevin	Donahue	GE Vernova
Mike	Meisinger	S&C
Amir	Makki	Softstuf



**D: LINE PROTECTION SUBCOMMITTEE****Chair:** Meyer Kao**Vice Chair:** Alla Deronja

**Scope:** Investigate and report on the relaying techniques and systems used for transmission and distribution (T&D) line protection. Develop statistics and recommend protection practices for improving line relaying performance. Develop and maintain standards for line protection.

- The Subcommittee meeting met in person (Buffalo, NY) on May 15, 2024. From 1:10 to 2:35 PM EST.
- Officer presiding – Meyer Kao
- Officer recording minutes – Alla Deronja
- The Subcommittee meeting was called to order by the Chair
- Introductions were made by the attendees
- The meeting was attended by 25 voting members and 47 guests. Quorum was met (25 out of 47).
- Minutes from the January 2024 meeting held in person were approved - motion made by Jon Sykes and seconded by Russ Patterson.
- Agenda for the D Subcommittee January 2024 meeting was approved - motion made by Chris Walker and seconded by Adi Mulawarman.
- We welcomed two new Subcommittee members: Melvin Monsey Joseph and Ian Tualla

The Chair reviewed items of interest from the Advisory Committee.

- WG Chairs: please send up to date minutes to Chair and VC by Friday, May 24, 2024
- In WG and Subcommittee meeting minutes, please include attendees, their affiliation, and their role (member or non-member)
- Reminders for WG Officers and D-subcommittee members:
  - Balloting on WG Reports, Transactions Reports, Surveys, Summary Papers requires at least 75% of the Subcommittee members to Approve.
  - Duties of SC members include timely response to assignments and ballots, as listed under PSRC O&P Subclause 4.4.4
  - Updated PSRC Procedures (P&P for Standards and WGs, and O&P) are available on PES-PSRC website, under Knowledge Base
  - For WGs whose output is a report, there needs to be two versions of the report, difference being the coversheet. One version of the report with simplified coversheet will be published and kept under PES-PSRC website, under Knowledge Base.
- Advisory Committee items of interest:
  - Attendance:
    - 159 for PSRC
    - 46 for PSCCC
    - 12 newcomers
  - Future Meetings
    - September 2024 – Scottsdale, AZ
    - JTCM 2025 – Garden Grove, CA
    - May 2025 – Portland, OR
  - Main Committee meeting starts at 7:30 AM
    - Breakfast will be served

- PSRC B5 Publicity Working Group is looking for volunteers

#### IEEE Standards Documents - D Subcommittee

No.	Approval Date	Name
C37.113	2015	Guide for Protective Relay Applications to Transmission Lines
C37.114	2014	Guide for Determining Fault Location on AC Transmission and Distribution Lines
C37.243	2015	Guide for Application of Digital Line Current Differential Relays Using Digital Communication
C37.104	2022	Guide for Automatic Reclosing on AC Distribution and Transmission Lines
C37.230	2020	Guide for Protective Relay Applications to Distribution Lines

### Working Group Reports

- WG meeting minutes
  - Assignment
  - Draft number
  - Writing assignments
  - Motions (with name)
  - Attendance records (name/affiliation)
- Meeting requests
  - Next meeting room requirements
  - Number sessions
  - Number participants
  - A/V requirements
  - Avoid conflicts with other WG meetings

Working groups gave reports on their activity.

### **D29: Tutorial for Setting Impedance-Based Power Swing Relaying on Transmission Lines**

The WG did not meet. It is expected to meet in September 2024.

### **D30: Tutorial on Application and Setting of Ground Distance Elements on Transmission Lines**

**Chair: Karl Zimmerman**

**Vice Chair: Ted Warren**

**Output: Tutorial**

**Expected Completion Date: September 2024**

**Draft 9.0**

**Working Group Assignment: Write a tutorial on factors affecting the application and setting of ground mho and quadrilateral distance elements on transmission lines**

Working Group D30 met in person in Buffalo, May 15, 2024 from 10:30 to 11:40 AM with a total of 19 attendees, including 4 voting members. Thus, a quorum was not achieved, so, we shall have to approve minutes via e-mail.

The technical report went to a ballot of the Subcommittee on March 9, 2023. As of Monday, September 18, 2023, we had received 37 responses, 33 approved, 4 disapprove, 11 with comments. To follow PES procedures, the WG is reviewing and responding to all comments received.

A total of 334 comments have been received from 11 reviewers. Members of the WG met March 15, March 25, March 27, April 4, and May 8 to continue to review and address comments. Most remaining unaddressed comments are editorial comments. The Chair discussed comments received, including an effort to split some figures (for example, split Figure 28 to Figure 28a and 28b)

Prior to the January meeting, the WG had addressed most of the technical comments by making some changes to the balloted draft. This included moving portions of Section 3 and 4 to Annex A.1 and A.2, and revising portions of Section 6.

We also discussed a comment to expand Section 7 – this is the section on setting guidelines and applications. The WG decided to add language that the examples and cases in the tutorial are not all inclusive, but that the protection engineer can use the examples and cases to help determine the worst case conditions for setting distance elements.

A copy of the latest draft, with and without redline has been sent to voting members and we will continue to schedule D30 review meetings via Teams or Webex. Once all comments have been addressed, and the WG approves, a clean and redline version of the report shall be sent to the Subcommittee.

Meeting was adjourned.

Propose a single session for 30 attendees for September 2024 with computer projector. Please avoid conflict with D44 and D47.

First Name	Last Name	Company Name	Role
Sebastien	Billaut	Commonwealth Associates, Inc	Voting Member
Joerg	Blumschein	Siemens	Voting Member
Ritwik	Chowdhury	SEL	Voting Member
Joshua	Lamb	Ameren	Voting Member
Van	Le	Western Area Power Administration	Voting Member
Ryan	McDaniel	SEL	Voting Member
Carolyn	Sun	IEEE	Voting Member
Christopher	Walker	Mesa Associates, Inc	Voting Member
Ted	Warren	Southern Company Services	Vice-Chair
Zhiying	Zhang	General Electric Company	Voting Member
Karl	Zimmerman	Ameren	Chair
Muhammad	Hamid	Black & Veatch	Guest
Andy	Kunze	Minnesota Power	Guest
Andre	Souza	Omicron	Guest
Kevin	Malpede	ComEd	Guest
Nestor	Casilla	Double Engineering	Guest
Art	Buanno	First Energy	Guest
Meyer	Kao	Qualus	Guest
Koustubh	Banerjee	Eversource Energy	Guest
Seth	Barnes	TVA	Guest
Tim	Condra	TVA	Guest
Jack	Jester	Exelon Corp	Guest
Daniel	Ridenour	Dominion Energy	Guest
Tom	Miller	ITC	Guest
Dean	Sorensen	National Grid	Guest

**D34: Coordinate with IEC 60255-187-3 (functional specification for line current differential requirements) and provide feedback)**

The WG did not meet. It is expected to meet in September 2024.

**D35: Evaluation of Transmission Line Pilot Protection Schemes**

**Chair:** Rick Gamble

**Vice Chair:** Brandon Lewey

**Established:** January 2017

**Output:** Technical report to the Line Protection Subcommittee

**Assignment:** Prepare a technical report to the line protection subcommittee to evaluate advantages and disadvantages of common transmission line pilot protection schemes, including

POTT, DCB, DCUB, and line current differential. The schemes will be evaluated in terms of speed, sensitivity, dependability and security based on the design and configuration of transmission lines and system topology. A limited number of example systems will be evaluated.

**Expected Completion date:** 09/2024

**Draft:** Final Draft 5

Working Group D35 met on Tuesday, May 14, 2024 at 8:00am in person with 13 members and 13 guests.

Introductions were made.

The WG discussed Subcommittee review comments.

Final Draft 6 will be submitted to Subcommittee D for approval.

For the next meeting, WG D35 will need a room for 50 and a computer projector.

**Action Items:**

- WG to review revised report with all subcommittee comments resolved.

First Name	Last Name	Role	05/14/2024
Seth	Barnes	Guest	X
Jeffrey	Barsch	Voting Member	X
Tony	Bell	Voting Member	X
Sebastien	Billaut	Voting Member	X
Arthur	Buanno	Voting Member	X
Alla	Deronja	Voting Member	X
Richard	Gamble	Chair	X
Mat	Garver	Voting Member	X
Addis	Kifle	Voting Member	X
Hillmon	Ladner Garcia	Guest	X
Joshua	Lamb	Voting Member	X
Brandon	Lewey	Secretary	X
Bruce	Mackie	Voting Member	X
Christopher	Walker	Voting Member	X
Abu	Zahid	Voting Member	X
Karl	Zimmerman	Guest	X
Jack	Jester	Guest	X
Ying	Hu	Guest	X
Paras	Patel	Guest	X
Tim	Condra	Guest	X
Kevin	Malpede	Guest	X
Mark	McChesney	Guest	X
Juan	Pineros	Guest	X
Genariel	Hernandez	Guest	X
Brandon	Davies	Guest	X
Dean	Sorensen	Guest	X

**D37: Report on Impact of Series Compensation on Transmission Line Protection****Chair: Mike Kockott****Vice Chair: Nuwan Perera****Secretary: Melvin Moncey Joseph****Output: Report****Draft: 1.12****Assignment: Write a report on Impact of Series Compensation on Transmission Line Protection.**

First Name	Last Name	Affiliation	Role
Tapan	Manna	Burns & McDonnell	Voting Member
Mike	Kockott	Hitachi Energy	Chair
Melvin	Moncey Joseph	Burns & McDonnell	Secretary
Galina	Antonova	Hitachi Energy	Guest
Craig	Marien	Eversource	Guest
Ter	Hlibka	Retired	Guest

D37 met on May 14<sup>th</sup> 2:20pm CT with 6 people in attendance.

Chair went through the multiple comments received from reviewers and edits were made in the document as needed.

It was proposed to have sessions in between in-person meetings to resolve all of the comments received.

For the next meeting, we request a room for 15 people, single session, with a computer projector. Please avoid conflicts with C29, C41, C48, C52, D29, D42, D47, J18, I49, B3, B5 and if possible, also D30, D38, J19

**D38: Impact of High SIR on Line Relaying****Chair: Chris Walker****Vice Chair: Greg Ryan****Secretary: Greg Ryan****Output: Technical Report****Established Date: January 2018****Expected Completion Date: January 2025****Draft: 1.5****Assignment: Prepare a technical report to the line protection subcommittee to evaluate the impact of high SIR on line protection.****Presiding Officer: Chris Walker****Minutes Recorded by: Josh Lamb****Agenda:**

1. Introductions/Sign up sheet/roster
2. Review Working Group Membership and Membership Process
3. Approve previous meeting minutes: first – Josh Lamb second - Jack Jester

4. Discuss status and progress of report
5. Review writing assignments
6. Discussion of next steps
7. Adjourn

### Minutes:

Chris opened the meeting and reviewed the voting members and membership requirements after introductions.

Previous meeting minutes were approved with the amendment of correcting the spelling of Ritwik's name.

Chris discussed the status of the report. We are working to attempt to publish the report prior to the publication of the line guide. The report will be sent to working group for approval upon the updates discussed at this meeting.

Discussion was held on adding an example of the effect of nominal voltage on SIR based upon a small section that is being removed from the current version of C37.113 to the report. The material which was located in section 5.2.1 of C37.113 will be adapted and added to the report, being sure to avoid copyright issues. Chris Walker to rewrite this material and include in the report. Josh Lamb to review.

The report will be submitted to the working group for approval with enough time to compile the working group comments prior to the September PSRC meeting.

Meeting Adjourned at 4:25 PM EDT

We request a meeting space for 40 with a projector in September. Please avoid conflicts with D42, D43 and D53.

Attendees: 11 Members, 24 total

Role	Last Name	First Name	Affiliation
Chair (Voting)	Walker	Christopher	Mesa Associates, Inc
Voting Member	Barsch	Jeff	AEP
Voting Member	Blumshein	Jorg	Siemens
Voting Member	Deronja	Alla	ATC
Voting Member	Gamble	Rick	TVA
Voting Member	Jester	Jack	Exelon Corp.
Voting Member	Lamb	Josh	Ameren
Voting Member	Lewey	Brandon	Ameren
Voting Member	Patti	Claire	PGE
Voting Member	Pineros	Juan	XM Colombia S.O.
Voting Member	Zahid	Abu	Hydro One
Guest	Barnes	Seth	TVA
Guest	Buanno	Art	First Energy
Guest	Condra	Tim	TVA
Guest	Conrad	Steve	Retired
Guest	Davies	Brandon	TRC
Guest	Hernandez	Genariel	Quanta Tech
Guest	Hughes	Joshua	Qualus

Guest	Jessup	Erin	SEL
Guest	Kunze	Andy	MN Power
Guest	Malpede	Kevin	ComEd
Guest	Miller	Tom	ITC
Guest	Rios	Miguel	Southern Company
Guest	Zimmerman	Karl	Ameren

**D42: Revise IEEE Std C37.113-2015, IEEE Guide for Protective Relay Applications to Transmission Lines**  
**Minutes for the 05/15/2024 meeting from 9:20 to 10:30 AM EDT**

**Chair:** Jeffrey Barsch

**Vice Chair:** Rick Gamble

**Secretary:** Josh Lamb

**Output:** Guide

**Established Date:** 5/5/2020

**Expected Completion Date:** 2024

**Draft:** 2.14

**Assignment:** Revise IEEE Std C37.113-2015, IEEE Guide for Protective Relay Applications to Transmission Lines

- a) Officers presiding – Jeff Barsch, Rick Gamble, and Josh Lamb
- b) Officer recording minutes – Josh Lamb
- c) Call to order – Jeff Barsch
- d) Agenda presented Abu Zahid 1<sup>st</sup> motion Chris Walker 2<sup>nd</sup> Motion. Voted to approve.
- e) Chair’s remarks – Copyright and patent slides discussed. No issues identified.
- f) Results of call for quorum – Quorum achieved. 19 WG of 34 Voting members participated, with 6 non-voting members and 10 guests.
- g) Minutes approved – 1<sup>st</sup> Motion Melvin Moncey Joseph, 2<sup>nd</sup> Motion Sebastien Billaut. Voted to approve.
- h) Brief summary of discussions and conclusions including any motions,
  - a. Discussed upcoming editing meetings,
  - b. Discussed extending PAR...request for PAR Extension in September.
  - c. Discussed submitting guide for additional comments to working group in late May early June for final comments and review from working group.
  - d. Addressed comments in sections: 5.8.7, 6.8.4, 6.9.4, A.2, A.3, Annex B References Voted to keep (without a majority) outdated references that are not referenced in the document.
- i) Action items:
  - a. Working group to resolve the remaining comments at two upcoming meetings on May 21 and 22.
  - b. Guide will be resubmitted to working group by May 29 for an additional review due to changes from comments, comments are due June 26.
- j) Recesses and time of final adjournment: Adjourned by Jeff Barsch at 10:30 am Eastern Daylight Saving Time.
- k) Next two meeting dates and location to complete comment resolution:
  - a. Virtual via Teams on Tuesday, May 21 from 11:00 a.m. – 12:30 p.m. EDT.
  - b. Virtual via Teams on Wednesday, May 22 from 12:00 p.m.– 1:30 p.m. EDT

**Attendees:**

First Name	Last Name	Role	Company
Jeffrey	Barsch	Chair	American Electric Power
Fred	Agyekum	Guest	SEL
Seth	Barnes	Guest	TVA



Tim	Condra	Guest	TVA
Daniel	Ridenour	Guest	Dominion Energy
Lubomair	Sevov	Guest	TRC Companies
Malia	Zaman	Guest	IEEE
Tom	Miller	Guest	ITC
Ding	Lin	Guest	<a href="#">Manitoba Hydro</a>
Koustubh	Banerjief	Guest	Eversource Energy
Faris	Elhaj	Guest	Burns and McDonnell Engineering Co
Timothy	Erwin	Guest	GE Vernova
Kenny	Sheffler	Guest	<a href="#">SEL</a>
Tony	Bell	Non-voting Member	Ametek
Arthur	Buanno	Non-voting Member	FirstEnergy
Robert	James	Non-voting Member	Pacific Gas & Electric Co.
Pratap	Mysore	Non-voting Member	Pratap Consulting Services LLC
Claire	Patti	Non-voting Member	Portland General Electric
			XM S.A. Colombia Power System
Juan	Pineros	Non-voting Member	Operator
Joshua	Lamb	Secretary	Ameren
Richard	Gamble	Vice-Chair	TVA
Joerg	Blumschein	Voting Member	SIEMENS
Stephen	Conrad	Voting Member	Public Service Co of NM - Retired
Alla	Deronja	Voting Member	American Transmission Company
Kamal	Garg	Voting Member	SEL
Meyer	Kao	Voting Member	Patterson Power Engineers
Michael	Kockott	Voting Member	Hitachi ABB Power Grids
Andy	Kunze	Voting Member	Minnesota Power
Daniel	Lebeau	Voting Member	CIMA+
Brandon	Lewey	Voting Member	Ameren
Bruce	Mackie	Voting Member	Nashville Electric Service
Melvin	Moncey Joseph	Voting Member	Burns and McDonnell Engineering Co
James	O'Brien	Voting Member	Duke Energy
Charles	Sufana	Voting Member	Retired
Ian	Tualla	Voting Member	Duke Energy
Christopher	Walker	Voting Member	Mesa Associates, Inc
Abu	Zahid	Voting Member	Hydro One

#### **D43: Report, Effect of Distribution Automation on Protective Relaying**

**Chair:** Greg Ryan

**Vice Chair:** Amin Zamani

**Secretary:** Joshua Hughes

**Output:** Technical Report

**Established Date:** January 2021

**Expected Completion Date:** December 2024 (updated)

**Draft:** 2.3

**Assignment:** Update the technical report "Effect of Distribution Automation on Protective Relaying".

**Scope:** Update the technical report "Effect of Distribution Automation on Protective Relaying" to add/increase discussion on DER integration, volt/var control, reconfiguration and the current complications of adaptation, addition of line sensors, peer-to-peer protocols, distance protection on distribution,

telecommunications, DTT for DERs, discussion on IBR (Inverter Based Resources), and Microgrids. The working group will update the existing report and determine if it is advisable to recommend to the subcommittee to form a working group to use this report to create an IEEE Guide.

Working Group D43 met in-person on May 15, 2024, at 08:00-09:10AM EST. There were total of 10 attendees (3 members and 7 guests or non-voting members). (There are 9 total voting members)

### Meeting Agenda

8. Introductions
9. Review Working Group Membership
10. Discuss status of the report and voting plan
11. Discussion of next steps
12. Adjourn

### Summary of Meeting Discussion

- The meeting started with the introductions (10 people attended in person). 3 voting members (out of 9) were present in the meeting.
- The agenda and current state of the report was presented.
- The team discussed comments from the D-subcommittee vote.
- Not all of the comments were addressed during the meeting. An online meeting prior to the September PSRC meeting will be scheduled to address additional comments.
- The meeting was adjourned at 09:10AM.

For next meeting, we request a room for 30 people with a projector and please avoid conflicts with D38, D53, C45, and C50.

#### Attendees:

1) Amin Zamani	Quanta Technology	Voting Member
2) Joshua Hughes	Qualus	Voting Member
3) Meyer Kao	Qualus	Guest
4) Swagata Das	SEL	Non-Voting Member
5) Yohann Beauliea	Hydro Quebec	Guest
6) Hani Al-Youse	Eaton	Guest
7) Kenny Sheffler	SEL	Guest
8) Juan Gers	GERS USA	Voting Member
9) Brandon Lewey	Ameren	Guest
10) Charles Pestell	Powell	Guest

#### **D44: IEEE Guide for Determining Fault Location on AC Transmission and Distribution Lines**

**Chair:** Sebastien Billaut

**Vice Chair:** Karl Zimmerman

**Secretary:** Looja Tuladhar

**Output:** Guide

**Established Date:** January 2020

**Expected Completion Date:** December 2024

**Draft:** 3.2

**Assignment:** Revise IEEE Std C37.114-2014, IEEE Guide for Determining Fault Location on AC Transmission and Distribution Lines

**Working group D44 met on May 15th, 2024, at 8:00, with 13 attendees.**

**4** voting members were present out of **14** current voting members, so **the quorum was not met. The previous meeting minutes approval will be requested via email.**

The Chair, Sebastien Billaut brought the meeting to order and showed the agenda, and the IEEE copyright guidelines slide for IEEE working group meetings.

Vice-Chair Karl Zimmerman recorded minutes.

The Chair presented the status of the balloting in progress. Currently, 96% of the voters approve, but only 36% have returned the Ballots.

For the next face-to-face, we will need a projector and a room for 30. Avoid conflict with C38, D30, D35, D38, D42, K27, K29, K35 and KTF33.

#### Meeting Attendees

First Name	Last Name	Company Name	Role
Sebastien	Billaut	Commonwealth Associates, Inc	Chair
Karl	Zimmerman	Ameren	Vice-Chair
Mike	Basler	Basler Electric	Guest
Swagata	Das	SEL	Voting Member
Souvik	Chandra	EATON	Guest
Andrew	Nguyen	TVA	Guest
Robert	James	Pacific Gas & Electric Co.	Voting Member
Claire	Patti	PGE	Guest
Paul	Harris	Pacificorp	Guest
Manish	Patel	EPRI	Guest
Jonathan	Sykes	Quanta Technologies	Guest
Malia	Zaman	IEEE SA	Guest
Koustubh	Banerjee	Eversource Energy Inc	Guest

**D45: Prepare a technical report to the line protection subcommittee to “document protection methods used to reduce wildfire risks due to transmission and distribution lines”**

**Chair:** Jonathan Sykes**Vice Chair:** Scott Hayes**Secretary:** N/A**Output:** Technical Paper**Established Date:** September 2020 (1<sup>st</sup> task force meeting)**Expected Completion Date:** Jan 2025**Draft:** Draft 2 (with edits), comments received**Assignment:** Prepare a technical report to the line protection subcommittee to “document protection methods used to reduce wildfire risks due to transmission and distribution lines.”

D45 WG met on 5/14/24 at 3:40pm (Eastern USA Time)

Members = will be adjusted based on attendance and participation

Attendance = 33 in room, 11 members, 1 non-voting member, 21 Guests; Quorum Established (11 of 17)

Jonathan opened the meeting with the following:

- Introductions, a discussion about Patent infringement (slides provided from leadership), the agenda, reviewed the minutes from the last WG, Jan 2024 (minutes approved)
- introduced draft 2 and initiated a discussion about the status of each section from the team leads.
  - Discussion and comments were noted and will be included in next draft
  - Email lists were corrected and draft 2 was resent to some participants
  - Sections will be sent to leads for review and additional comments.
  - Next draft will be sent out for comments and edits

For the next meeting, D45 will need a room for 40 and a computer projector.

**Attendance**

<u>Membership/Roster</u>	<u>S3</u>	<u>J4</u>	<u>M4</u>	<u>status</u>	<u>Guests 1/9/24</u>	<u>Guests 5/14/24</u>
• Jonathan Sykes Chair	x	x	x	m	Kamal Garg	Abel Gonzalez
• Scott Hayes Vice Chair	x	x	x	m	Mike Ramlachan	Daniel Whoroshanky
• Galina Antonova			x	m	David Caverly	April Underwood
• Hugh Borland	x	x		m	Alyssa Bender	Souvik Chandra
• Ritwik Chowdhury	x	x	x	m	Paul Nichols	Hani Al-Yousef
• Normann Fischer		x		nvm	Justin Turner	Fredy Bravo
• Matt Garver	x		x	m	Fredy Bravo	Mark McChesney
• Wayne Hartman			x	nvm	Mohasinian Kamal	Hillmon Ladner
• Daqing Hou	x	x		m	Maziar Isapour	Kenny Sheffler
• Robbie James	x	x	x	m	Mark McChesrey	Paul Harris
• Bruce Mackie		x	x	m	Abu Zahid	Tapan Manna
• Deepak Maragal		x	x	m	Lou Garavaglia	Daniel Ridenour
• Boris Marendic				nvm	Paul Harris	Jeysson Gonzalez
• Tony Marxsen				nvm	Mike Meisinger	Athula Rajapakse
• Nirmal Nair		x		m	Diane Nguyen	Jim O'Brien
• Russ Patterson	x	x	x	m	Jackie Wilson	Mike Kockott
• Henry Quin		x		m	David Caverly	Meyer Kao
• Dan Ransom	x	x		m	Raluca Lascu	Steven Blair
• Matthew Reno			x	m	Dhruv Patel	Pratap Mysore
• Douglas Taylor	x			nvm	Robert Fowler	Mukesh Nagpal
• Eric Udren	x	x		m		Kamal Garg
• Ari Wahlroos				nvm		
• Joe Xavier				nvm		
• Yujie Yin		x		nvm		
• Amin Zamani	x		x	m		

	1/9/24	5/14/24
Members(m)	20	17
NonVoting Members (nvm)	8	8
Moved to guests	2	3

#### **D47: Revision of C37.243 IEEE Guide for Application of Digital Line Current Differential Relays Using Digital Communication**

**Chair:** Alla Deronja

**Vice-chair:** Steve Klecker

**Secretary:** Galina Antonova

**Established:** January 2021

**Output:** Guide

**Draft:** 8.2

**Expected Completion Date:** December 2025

**Assignment:** To revise the C37.243 IEEE Guide for Application of Digital Line Current Differential Relays Using Digital Communication

This work is a joint project between the PSRC leading and PSCCC supporting it.

The WG D47 met with 18 voting members, 1 non-voting member, and 6 guests on Wednesday, May 15, 2024, at the PSRC May 2024 meeting.

After the introductions, the WG chair displayed the IEEE-SA Copyright, Patent, and Behavior policy slides as required for the working groups with PAR related activities. There were no issues or objections from the meeting participants.

The quorum was not met at the beginning of the meeting, so the JTCM May 10 meeting minutes will be sent to the WG electronically for approval.

The meeting agenda was approved. Motion: Joerg B, 2<sup>nd</sup>: Austin W.

Between JTCM in January and PSRC in May 2024 face-to-face meetings, the WG internally balloted guide revision draft 8.0.

The results of the internal WG ballot were as follows.

1. 30 out of 35 WG voting members voted (86%; needed 75%)
2. 26 approved/approved with comments, 4 disapproved
3. Received 664 comments and counting

The WG started addressing the internal ballot comments at the first two webex meetings held on April 29 and May 6. Additional weekly webex meetings have been scheduled to continue the internal ballot comment resolution process.

The WG proceeded to address some technical topics that arose during the initial comment resolution Webex meetings.

- Current ratio plane

A comment was made relative to the definition of "current ratio plane". The commenter proposed using "alpha plane" instead of "current ratio plane". A consensus was not reached during a discussion at a previous webex meeting. In subclause 6.4.2 *Alpha plane differential characteristic*, current ratio plane is mentioned to include both alpha and beta planes. A few options to resolve this were as follows: 1. add "(alpha and beta)" to the definition (no one was in favor of this option at the webex); 2. leave as is and

start 6.2.4 from "current ratio plane" vs. "alpha plane" (5 persons were in favor); 3. drop current ratio plane and define alpha plane (3 persons were in favor); 4. leave as is (no one favored this option).

At this meeting, it was noted that this topic is handled in one subclause. Current ratio plane is mentioned only once in the document besides its definition. Therefore, the WG agreed to remove the definition and start 6.2.4 with more general "current ratio plane".

- Microprocessor-based vs. digital relay definition

A commenter suggested the present definition for a microprocessor-based relay is not useful and proposed to replace it. We found an existing definition for a digital relay that matched a definition proposed by the commenter in the C37.91 guide for power transformer protection and agreed to adopt it instead. The issue was whether to use microprocessor-based and digital relay references interchangeably in the guide or use only "digital relay(s)" consistently.

At this meeting, it was mentioned that also "numerical relay(s)" are used. A decision is to consistently use "digital relay(s)" throughout the document per the WG I2 *Terminology* direction and add a footnote to the first mentioning of "digital relay(s)" in 5.3.1: Also referred to as microprocessor-based or numerical.

- LCD with different phasing at local and remote substations

An outside comment was made relative to line current differential applications with different phasing. On some lines, especially tie lines between utilities, the phase identification may be different between two stations. That is, at one station, the physical phase identification would be A, B, C while, at the remote station the rotation is the same, but phase correspondence is not. For example, Station 1 A-phase is physically the same phase as the C-phase at Station 2.

The problem is at that terminal with the rolled phases to the relay where faulted phase identification would not be correct for that relay, either on 87L or 21 elements. With modern microprocessor relays, it would be nice to have the option of rolling the received digital remote terminal current to match the local phase identification. Maybe some members of the WG are from relay manufacturers, and they can take this suggestion back to their company.

One WG member mentioned this function is already implemented in SIEMENS relays and offered to provide more information to anyone interested.

Is the author of this issue referring to the phases physically rolled or just the different phase IDs? A feeling among the WG members was not to include this in the guide because it is not a part of protection but system configuration. For clarification, the guide could state that relays compare common reference A-phase current with remote A-phase current. It would fit in clause 9 *Testing and troubleshooting*.

- Line current differential vs. pilot protection

This subclause (4.2.1) was revised per a comment. The proposed revision was reviewed during the meeting. A concern was raised relative to mentioning that pilot protection needs to allow for communication delays and pickup/dropout times of directional elements during current reversal. At the same time, as presently stated in the document, during current reversal, line current differential immediately detects the changes at all terminals through their current summations. This may be incorrect as there is a delay in a trip decision by the current differential function.

Another question was the need for comparison of line current differential with other forms of protection (pilot protection, impedance, overcurrent, etc.). Since multifunctional relays contain all available line

protection functions and allow selecting any functions for a given application, this comparison may no longer be suitable to be in the present guide but, rather, should be addressed in the line protection guide (C37.113).

The WG may consider removing *4.2 Line current differential vs. other forms of line protection*.

The meeting agenda was completed, and the meeting was adjourned.

#### Meeting Attendees

Role	First Name	Last Name	Affiliation
Guest	Gene	Henneberg	Nevada Energy
Guest	Jack	Jester	Delmarva Power- Exelon
Guest	Meyer	Kao	Qualus
Guest	Daniel	Lebeau	Hydro Quebec
Guest	Ding	Lin	Manitoba Hydro
Guest	Juan	Piñeros - XM	XM S.A. Colombia Power System Operator
Non-Voting Member	Kevin	Malpede	ComEd
Voting Member	Fred	Agyekum	Schweitzer Engineering Laboratories
Voting Member	Joerg	Blumschein	SIEMENS
Voting Member	Sudarshan	Byreddy	Burns & McDonnell
Voting Member	Tom	Dahlin	Schweitzer Engineering Laboratories
Voting Member	Kamal	Garg	Schweitzer Engineering Laboratories, Inc.
Voting Member	Dinesh	Gurusinghe	RTDS Technologies Inc.
Voting Member	Michael	Kockott	Hitachi ABB Power Grids
Voting Member	Bruce	Mackie	Northern Arizona University
Voting Member	Gayle	Nelms	Schweitzer Engineering Laboratories, Inc.
Voting Member	James	O'Brien	Duke Energy
Voting Member	Paras	Patel	TRC
Voting Member	Ian	Tualla	Duke Energy
Voting Member	Austin	Wade	SEL
Voting Member	Christopher	Walker	Mesa Associates, Inc
Voting Member	Donald	Ware	Qualus
Voting Member	Abu	Zahid	Hydro One Network Inc.
Voting Member/Chair	Alla	Deronja	ATC
Voting Member/Secretary	Galina	Antonova	Hitachi ABB Powergrids

#### **Old Business**

##### WG internal ballot comment resolution webex meeting #2

The WG D47 met with 9 voting members and 4 non-voting members on Monday, May 6, 2024, in webex meeting #2 to continue resolving the comments received from the WG members in the result of the internal WG ballot of guide revision draft 8.0.

The WG chair sent the IEEE-SA Copyright, Patent, and Behavior policy slides as required for the working group with PAR related activities before the meeting for the WG members' review.

At this Webex, the WG resolved additional 44 comments. The comment resolutions are recorded in the comment resolution spreadsheet.

Next webex meeting (#3) is scheduled for May 20, 2024.

#### Meeting Attendees

Role	First Name	Last Name	Company
Non-Voting Member	Gopal	Gajjar	PowerAnser Labs. Pvt. Ltd.
Non-Voting Member	Alex	Lee	AEP
Non-Voting Member	Kevin	Malpede	ComEd
Non-Voting Member	Ryan	McDaniel	Schweitzer Engineering Laboratories
Voting Member	Abu	Bapary	American Electric Power (AEP)
Voting Member	Joerg	Blumschein	SIEMENS
Voting Member	Bruce	Mackie	Northern Arizona University
Voting Member	Gayle	Nelms	Schweitzer Engineering Laboratories, Inc.
Voting Member	James	O'Brien	Duke Energy
Voting Member	Taylor	Raffield	Duke Energy
Voting Member	Ian	Tualla	Duke Energy
Voting Member	Donald	Ware	Qualus
Voting Member/Chair	Alla	Deronja	ATC

#### WG internal ballot comment resolution webex meeting #1

The WG D47 met with 15 voting members and 5 non-voting members on Monday, April 29, 2024, in webex meeting #1 to start resolving the comments received from the WG members in the result of the internal WG ballot of guide revision draft 8.0.

The WG chair sent the IEEE-SA Copyright, Patent, and Behavior policy slides as required for the working group with PAR related activities before the meeting for the WG members' review.

At this Webex, the WG resolved the first 30 comments out of 664. The comment resolutions are recorded in the comment resolution spreadsheet.

Next webex meeting (#2) is scheduled for May 6, 2024.

#### Meeting Attendees

Role	First Name	Last Name	Company
Non-Voting Member	Gopal	Gajjar	PowerAnser Labs. Pvt. Ltd.
Non-Voting Member	Chikashi	Komatsu	Hitachi, Ltd
Non-Voting Member	Alex	Lee	AEP
Non-Voting Member	Kevin	Malpede	ComEd
Non-Voting Member	Neil	Saia	Entergy
Voting Member	Fred	Agyekum	Schweitzer Engineering Laboratories
Voting Member	Abu	Bapary	American Electric Power (AEP)
Voting Member	Daqing	Hou	Schweitzer Engineering Labs.
Voting Member	Chris	Huntley	Schweitzer Engineering Laboratories, Inc.
Voting Member	Bruce	Mackie	Northern Arizona University
Voting Member	Gayle	Nelms	Schweitzer Engineering Laboratories, Inc.
Voting Member	James	O'Brien	Duke Energy



Voting Member	Qun	Qiu	AEP
Voting Member	Thomas	Rudolph	Schneider Electric GmbH
Voting Member	Arun	Shrestha	Schweitzer Engineering Laboratories, Inc.
Voting Member	Ian	Tualla	Duke Energy
Voting Member	Austin	Wade	SEL
Voting Member/Chair	Alla	Deronja	ATC
Voting Member/Secretary	Galina	Antonova	Hitachi ABB Powergrids
Voting Member/Vice-Chair	Steve	Klecker	Unaffiliated

**D48: Investigate the need to create report on Single phase trip and reclose on transmission lines**

**Chair: Kamal Garg**

**Vice Chair: Ilia Voloh**

**Secretary: N/A**

**Output: Report**

**Established Date: Sep 2021**

**Expected Completion Date: Dec 2025**

**Draft: V4.2 May 15, 2024**

## PSRC D48

**Date: Wednesday, May 15, 2024**

**Time: 10:40 – 11:50 AM (EST)**

**Venue: IEEE PSRC, Buffalo, NY**

1. Total 27 people (6 remote + 21 in person). Quorum was not achieved hence minutes will be sent for approval via email.
2. Kamal gave overview of sections and progress.
3. PG&E Transmission system, SPT, Series compensated lines and various other PG&E practices were presented by Davis Erwin and Monica. Good discussion about PG&E relay philosophy, number of relays used and various reclosing practices also.
4. Ajmal from PG&E presented about IBR protection, type 3, type 4 field events and response. Good discussion. Phase selection for different manufacturers is discussed in the report.
5. Gary Kobet presented 500kV Line SPT near generation which has been in service from long time. Upgrade from coal to new combustion generation may require some additional considerations to make SPT work. Good discussion.
6. Mukesh presented what to considered for the nearby system when you do SPT. A good discussion on this topic.
7. Multiterminal line SPT protection practice was discussed by Joerg, Siemens.
8. Hoping to get first draft ready before September meeting.
9. Expecting one virtual meeting before September meeting, if enough progress on the draft.
10. Adjourn

## Voting Members

Bruce	Mackie		David	Lopez
William	Cook		Ritwik	Chowdhury
Ilia	Voloh		John	Town
Pratap	Mysore		Aaron	Martin
Gene	Henneberg		Dinesh	Gurusinghe
Kamal	Garg		Athula	Rajapakse
Mukesh	Nagpal		Alla	Matchyaraju
Stephen	Conrad		Steve	Kleckner
Gary	Kobet		Qun	Qiu
Joerg	Blumschein		Abu	Bapary
Mike	Kockott		Daqing	Hou
Fernando	Calero		Ding	Lin

## Meeting Participant (5/15/2024)

Fist Name	Last name	Affiliation	Role
Kamal	Garg	SEL	M
Mukesh	Nagpal	B&M	M
Ajmal	Saeed	PG&E	G
Pratap	Mysore	Ulteig	M
Dinesh	Gurusinghe	RTDS	M
Daniel	Lebeau	Hydroquebec	G
Ding	Lin	Manitoba Hydro	M
Jeysson	Gonzalez	S&C Electric	G
Scott	Haes	PG&E	G
Galina	Antenova	Hitachi	G
Paul	Harris	Pecificorp	G
Fred	Agyekum	SEL	G
Deepak	Maragal	LNDTS	G
Mike	Kockott	Hitachi	M
Sudarshan	Reddy	B&M	G
Faris	Elhaj	B&M	G
Joerg	Blumshein	Siemens	M
Steve	Conrad	Retired PNM	M
Gary	Kobet	TVA	M
Ritwik	Chowdhury	SEL	M
Fernando	Calero	SEL	M
Davis	Erwin	PG&E	G
David	Cavelry	Trench	G
Waruna	Chandrasena	Manitoba Hydro	G
Daqing	Hou	SEL	M
Monica	Anderson	PG&E	G
Daniel	Marquis	PNM	G

**D50: Prepare a summary paper for IEEE Std C37.104 Guide for Automatic Reclosing on AC Transmission & Distribution Lines**

Motion: Manish Patel made a motion to disband D50 WG as it completed its assignment

Second: Bruce Mackie

The motion passed with no objections.

**D51: Single Phase Tripping and Reclosing of Distribution Lines**

**Chair:** Brian Boysen

**Vice Chair:** Jack Jester

**Secretary:** Sudarshan Byreddy

**Output:** Technical Report

**Established Date:** January 2023

**Expected Completion Date:** TBD

**Draft:** 1.6

**Assignment:** To develop a Technical Report to Single Phase Tripping and Reclosing of Distribution Lines.

**Presiding Officer:** Jack Jester

**Minutes Recorded by:** Brittany Wagner

**Agenda:**

1. Introductions
2. Review January Meeting Minutes
3. Review Outline and discuss any additions
4. Went through sections 1.0, 2.0, 2.2, 3.1, 3.2, and 4.0
5. Check status of open assignments

**Minutes:**

- The D51 Working Group met at 10:40AM on 5/14/24.
- There were **20** people in attendance (8 Members, 1 New Member and 11 Guests; see below).
- Meeting minutes from the January meeting were reviewed.
- The outline was reviewed.
- Discussion was made regarding impacts such as single phasing a three phase customer, and the impact of single phase trip and lockouts on three phase motors.
- Assignment progress for various sections:
  - o 1.0 Introduction – Brian Boysen (Assignment completed)
  - o 2.0 Benefits and Reliability – Swagata Das and Kamal Garg (Assignment completed) - It was brought up that originally this was designed for the effects of single phase tripping and single phase lockout. Discussed benefits or reliability.
  - o 2.2 Other Benefits – Swagata Das & Brittany Wagner mentioned their topics for review, and some were added, they will continue editing the writeup. Discussions included revenue loss/gains, contact wear or maintenance, fault location and tracking, etc... It was discussed that the other benefits are relatively small compared to reliability and we

would exclude options if there was not enough to discuss like contact wear is almost negligible.

- 3.1 Ground Fault Protection – Greg Ryan and Brian Boysen (Assignment completed)
    - Reviewed the figures. For the Ground Element Blocking figure, it was brought up that it looks more like a manufacturer logic and not a customer logic in the device. A load imbalance or fault would trigger the Torque Control Switch. Meyer Kao thought the paragraph before the figure explains it well.
    - It was brought up that blocking grounds and adjusting the ground settings up are solutions to the issue of ground trips. Comments were made regarding ground protection and then posing two or more “solutions”.
    - Brittany Wagner volunteered to add discussion for leaving residual ground enabled and change operating mode during high load conditions. She will send and edit the writeup before the next meeting.
  - 3.2 Directional Settings – Paul Harris & Brittany Wagner sent in their sections for this. It was brought up that HLT can block single phase operations, also the use of sync check.
  - 4.0 Section 4 impacts were reviewed and will look to see if additions are necessary. The affect of DERs and imbalances were discussed.
- Discussion was made into a centralized location for all to edit and track? i.e. OneDrive or other IEEE writing location.
  - Discussion was made regarding adding a testing section for testing the elements, confirming phasing and tipping of correct phases, harmonics, etc.. and also to Operational Considerations?
  - We will reach out to those with pending sections. From the January meeting, the Sections 4.5, 4.7 and 4.8.

#### Meeting Requirements for May

Room for 35 with Projector; single session. Meeting Conflicts: D53, K29

Meeting Attendance for the 5/14/24 WG meeting is listed below:

First Name	Last Name	Affiliation	M/G/New Member
Jack	Jester	Exelon	M
Brittany	Wagner	Delaware Elec Coop	M
Sudarshan	Byreddy	Burns and Mac	M
Scott	Elling	Burns and Mac	G
Greg	Hataway	Burns and Mac	New Member
Swagata	Das	SEL	M
Todd	Martin	Basler Electric	G
Andre	Souza	Omicron	G
Dinesh	Gurusinghe	RTDS	G
Scott	Hayes	PG&E	G
Paul	Harris	Pacificorp	M
Fredy	Bravo	Duke Energy	M
Bruce	Mackie	Northern Arizona University	M
Ted	Hlibka	Retired	G

Souvik	Chandra	EATON Corp	G
Athula	Rajapakse	University of Manitoba	G
Daniel	Lebeau	Hydro Quebec	G
Meyer	Kao	Qualis	M
Charles	Sufana	Retired	G
Mike	Meisinger	S&C Electric	G

**DTF52: Task Force on investigating forming a Working Group on “Line Protection based on Transient Quantities”**

The TF did not meet. It is expected to meet in September 2024.

**D53: Report on distribution line protection practices survey**

**Chair:** Muhammad Hamid

**Vice Chair:** Greg Ryan

**Secretary:** Brian Boysen

**Output:** Report

**Established Date:** September 2023

**Expected Completion Date:** September 2027

**Draft:** 0.0

**Assignment:** Create and issue an industry survey on distribution line protection practices and associated distribution protection topics. The working group will create a report based on the survey results.

**Presiding Officer:** Muhammad Hamid

**Minutes Recorded by:** Brian Boysen

**Agenda:**

13. Introductions/Signup sheet
14. Review the assignment
15. Review previous report
16. Request volunteers for sections of survey
17. Discussion of next steps
18. Adjourn

**Minutes:**

- Introductions were made and the signup sheet was passed around.
- There were 12 Members and 3 Guests in attendance. Attendance roster is provided below.
- Muhammad discussed how the survey could be conducted
  - His company could sponsor developing the survey using their existing software
  - He shared a sample of the electronic survey

- He discussed various ways the survey could be developed including methods for starting and stopping the survey and expanding questions based on responses
- The previous survey questions were reviewed. Brian Boysen will convert the survey questions into a Word Format and they will be sent to Working Group (WG) members for them to review prior to the next WG Meeting
- The WG provided feedback for the overall survey including:
  - Adding utility demographic questions to the survey including size, region, etc.
  - Consider issuing a trial survey to WG members to test its ease of use and effectiveness
  - Add an Appendix with definitions and/or explanations of some of the terms used in the survey
  - Methods / Clarification to maintain confidentiality of respondents
- The following WG members volunteered to review and update sections of the previous survey:
  - Section 1 – General: Carolyn Sun & Muhammad Hamid
  - Section 2 – Considerations: Muhammad Hamid
  - Section 3 – System Data: Charles Sufana
  - Section 4 – Phase Protection: Swagata Das
  - Section 5 – Ground Protection: Swagata Das
  - Section 6 – Reclosing at the Substation: Daniel LeBeau & Xiangyu Ding
  - Section 7 – System Faults: Daniel LeBeau & Kostubh Banerjee
  - Section 8 – Cold Load Pickup and Magnetizing Inrush: Charles Sufana
  - Section 9 – System Operation: Charles Sufana
  - Section 10 – Effect of Dispersed Sources of Generation: Charles Sufana
  - Section XX – High Impedance Protection: Hani Al-Yousef
  - Section XX – Single phase tripping: Brian Boysen
  - Review of Transformer Protection Questions in the Survey: Robert James
- D53 plans to meet at the PSRC meeting in September and requests a room for 30 with a projector. Please avoid conflicts with C52, D38, D42, D43 & D51.

## 5/14/24 D53 WG Meeting Attendance Roster

	<b>Role</b>	<b>Name</b>	<b>Affiliation</b>
Chair	Voting Member	Muhammad Hamid	Black and Veatch
Secretary	Voting Member	Brian Boysen	We Energies
Vice-Chair	Voting Member	Greg Ryan	Ameren
	Voting Member	Carolyn Sun	Black and Veatch
	Voting Member	Charlie Sufana	Retired
	Voting Member	Craig Webster	GE Verona
	Voting Member	Daniel Lebeau	Hydro Quebec
	Voting Member	Hani Al-Yousef	Eaton
	Voting Member	Paul Harris	Pacificorp
	Voting Member	Robert James	PG&E
	Voting Member	Swagata Das	SEL
	Voting Member	Xiangyu Ding	S&C
	Guest	Adi Mularaman	Xcel Energy

Guest	Koustubh Banerjee	Eversource
Guest	Meyer Kao	Qualus

#### **D54: Evaluate creation of a report on protection methods utilized on compensated neutral grounded distribution systems**

**Chair:** Russ Patterson

**Vice Chair:** Hugh Borland

**Secretary:** N/A

**Output:** Report to the subcommittee.

**Assignment:** Develop a report describing protection and fault location methods in use on non-effectively grounded and compensated grounded distribution systems.

**Attendees:** 5 members and 16 guests. The members present are listed below with affiliations (met 5/15/2024).

Russ Patterson (Qualus)

Sudarshan Byreddy (Burns & McDonnell)

Paul Harris (PacifiCorp)

Dean Sorensen (National Grid) New member

Charlie Sufana (Retired) New member

The chair listed the report outline showing writing assignments as summarized below. Writing assignments are due **August 1**.

Russ Patterson Sect. 1.

Lothar Fickert Sect. 2, 4, 5.3, 7

Hugh Borland Sect. 3, 8

Ari Wahlroos Sect. 5.1, 5.5, 6

Gernot Druml Sect. 5.4.1, 5.4.2, 5.6, 5.7

Bingyin Xu Sect. 5.4.4

Charlie Sufana Drawings/figure homogenization

Next, we watched a presentation by Ari Wahlroos on a new method of earth fault protection on compensated distribution systems (IFPTOC) coordinating with touch potential limits. The link to the presentation is below.

<https://event.on24.com/wcc/r/4559238/BA0BAA7A5EFE2CEC2FAEB8A5C7CC6C3F>

**Next Meeting:** Room for 30 with computer projector. Avoid conflict with D45, DTF55, and C45 as possible.

#### **DTF55: Protection of HVDC systems and dc distribution systems**

**Minutes for the 05/14/2024 meeting from 14:20-15:30**

**Chair:** Brandon Lewey

**Established:** January 2024

**Assignment:** Investigate a Future Course of Action for Protection of HVDC Transmission and DC Distribution Systems and set up a liaison with the T&D HVDC Subcommittee

**Location:** Buffalo, NY

Formalities:

- The TF met on 05/14/2024.
- Officer presiding – Brandon Lewey

- The meeting was called to order by the Chair.
- Introductions were made.
- The meeting was attended in person and virtually by 1 member for a total of 23.
- Summary of discussions and conclusions:
  - Chair is looking for DC Distribution contacts pertaining to presentations.
  - Presentation links have been updated so that PSRC ShareFile system access is not required.
- **Presentation Links:**
  - [Presentation #1](#) – 3/22/2024 – Impacts of VSC Based HVDC Transmission on AC System Protection
  - [Presentation #2](#) – 4/19/2024 – Introduction of DC Protection
  - [Presentation #3](#) – 5/14/2024 – Update on IEC Direction
- **Action Items:**
  - Chair will coordinate and arrange presentations on various topics.
- WG Adjourned at 15:32

**Next Meeting Date:** September 2024

**Next Meeting Location:** Scottsdale, AZ

**Next Meeting Requirements:** potential virtual option with room big enough for 40

**Avoid Conflicts with:** D38, D35, D42, D47, C41, & K25

Abu	Zahid	
Ding	Lin	Manitoab Hydro
Geraint	Chaffey	Katholieke University
Josh	Lamb	Ameren
Brandon	Lewey	Ameren
Meyer	Kao	Qualus
Chip	Christmann	Basler
Dinesh	Gurusinghe	RTDS
Michael	Thompson	SEL Eng Services
Robert	James	PG&E
Gene	Henneberg	NV Energy
Libin	Varghese	NYPA
Athula	Rajapakse	University of Manitoba
Will	English	Consumers Energy
Randy	Hamilton	Basler
Matt	Black	Sargent & Lundy
Joshua	Park	Southern Cal Edison
Muhammad	Hamid	Black & Veatch
Michael	Higginson	S&C Electric Company
Jim	Niemira	S&C Electric Company
Alla	Deronja	ATC
Rick	Gamble	TVA
Andrew	Nguyen	TVA



**Liaison Reports**

- T&D Committee/Distribution Subcommittee
  - Smart Distribution
  - Volt-VAR
  - Switching & Overcurrent Protection
- We are still in search of volunteer to be the D-Subcommittee liaison to the T&D Committee/Distribution Subcommittee

**Old Business**

Note, if webex WG meetings were held in between the PSRC regular meetings, meeting minutes would be placed under Old Business of the WG minutes for Jan., May, or September

No 75% voting rate was achieved for SC balloting on the D35 and D43 technical reports. The SC chair will be reaching toe the SC members who did not submit their votes

**New Business**

Alex Apostolov proposed to start a task force to write a report on IEC 61850 effect on transmission line protection that is based on Internet communications. A report would focus on the following topics:

Routable GOOSE

Communication channel requirements

Cybersecurity and functional security

Melvin Joseph Moncey made a motion to start a task force. Sebastien Billaut seconded.

The motion passed with no objections. Alex Apostolov will chair DTF56.

Alla has been tasked to develop and document criteria for identifying areas in her company's system with high IBR concentration and their boundaries for line protection performance assessment within these areas. She was not sure what would be the best method to define these criteria and wondered if someone has worked on a similar task and can provide the insight.

**General Discussion**

None

**Line protection operations of interest**

Meyer presented a case of a sympathetic transformer inrush

**Adjournment**

The agenda was completed, and the meeting was adjourned.

**Meeting Attendees**

Role	First Name	Last Name	Affiliation
Member	Jeffrey	Barsch	American Electric Power
Member	Sebastien	Billaut	Commonwealth Associates, Inc
Member	Jörg	Blumschein	SIEMENS
Member	Richard	Gamble	TVA

Member	Kamal	Garg	Schweitzer Engineering Laboratories, Inc.
Member	Scott	Hayes	PACIFIC GAS AND ELECTRIC
Member	Michael	Kockott	Hitachi Energy
Member	Joshua	Lamb	Ameren
Member	Brandon	Lewey	Ameren
Member	Bruce	Mackie	Northern Arizona University
Member	Melvin	Moncey Joseph	Burns & McDonnell
Member	Adi	Mulawarman	Xcel Energy
Member	Pratap	Mysore	Pratap Consulting Services LLC
Member	James	O'Brien	Duke Energy
Member	Manish	Patel	EPRI
Member	Russ	Patterson	Qualus Power Services
Member	Claire	Patti	Portland General Electric
Member	Charles	Sufana	Retired
Member	Jonathan	Sykes	Quanta Technology
Member	Ian	Tualla	Duke Energy
Member	Christopher	Walker	Mesa Associates, Inc
Member	Amin	Zamani	Quanta Technology
Member	Karl	Zimmerman	Ameren
Member/Chair	Meyer	Kao	Qualus Power Services
Member/Vice-Chair	Alla	Deronja	American Transmission Company
Non-member	Galina	Antonova	Hitachi Energy
Non-member	Alex	Apostolov	OMICRON
Non-member	Seth	Barnes	TVA
Non-member	Tony	Bell	Ametek
Non-member	Matt	Black	Sargent & Lundy
Non-member	Steve	Blair	Synaptec
Non-member	Arthur	Buanno	FirstEnergy
Non-member	Sudarshan	Byreddy	Burns & McDonnell
Non-member	Nestor	Casilla	Doble Engineering
Non-member	Tim	Condra	TVA
Non-member	Milo	Daub	Mesa Associates, Inc
Non-member	Brandon	Davies	TRC
Non-member	Faris	Elhaj	Burns & McDonnell
Non-member	Abel	Gonzalez	Megger
Non-member	Jaysson	Gonzalez	S&C Electric
Non-member	Muhammad	Hamid	Black & Veatch
Non-member	Paul	Harris	Pacific Corp
Non-member	Greg	Hataway	Burns & McDonnell
Non-member	Michael	Higginson	S&C Electric Company
Non-member	Robert	James	Pacific Gas & Electric Co.

Non-member	Jack	Jester	Exelon Corporation
Non-member	Addis	Kifle	Georgia Transmission Corporation
Non-member	Andy	Kunze	Minnesota Power
Non-member	Daniel	Lebeau	Hydro-Quebec
Non-member	Ding	Lin	Manitoba Hydro
Non-member	Chase	Lockhart	1898 & Co. Part of Burns & McDonnell
Non-member	Kevin	Malpede	ComEd
Non-member	Craig	Marien	Eversource Energy
Non-member	Todd	Martin	Basler Electric
Non-member	Mark	McCchesney	ONCOR
Non-member	Michael	Meisinger	S&C Electric
Non-member	Mukesh	Nagpal	Burns & MCDonnell
Non-member	James	Niemira	S&C Electric Company
Non-member	Paras	Patel	TRC
Non-member	Juan	Pineros	XM S.A. Colombia Power System Operator
Non-member	Athula	Rajapakse	University of Manitoba
Non-member	Daniel	Ridenour	Dominion Energy
Non-member	Daniel	Sabin	Schneider Electric
Non-member	Dean	Sorensen	National Grid
Non-member	Andre	Souza	Omicron
Non-member	Marcos	Velazquez	Doble Engineering
Non-member	Quintin	Verzosa	Doble Engineering
Non-member	Austin	Wade	SEL
Non-member	Brittany	Wagner	Delaware Electric Cooperative
Non-member	Craig	Wester	GE Vernova
Non-member	Abu	Zahid	Hydro One Network Inc.
Non-member	Malia	Zaman	IEEE

## IEEE Power System Relaying and Communications Committee H - Relaying Communications and Control Subcommittee

Wednesday, May 15, 2024, 4:20 pm – 5:45 pm EST

Hyatt Regency Buffalo, Buffalo, NY

Room: Grand Ballroom BCD (In-Person Meeting)

### MEETING MINUTES

**Chair:** Hugo Monterrubio – [HugoM@ieee.org](mailto:HugoM@ieee.org)

**Vice Chair:** Mital Kanabar – [Mital.Kanabar@ieee.org](mailto:Mital.Kanabar@ieee.org)

**Secretary:** Dean Ouellette - [dsouellette@ieee.org](mailto:dsouellette@ieee.org)

**Scope:** Evaluate and report on the characteristics and performance of protective relaying communications and control systems. Recommend communication requirements, operating and test procedures which assure reliable performance of the overall protection and control system. Report on new relaying equipment designs tailored to specific communication requirements. Included are matters necessary to the function of such systems employed in the generation, transmission, distribution, and utilization of electrical energy, and their effects on system operation. Control systems include data acquisition and processing from devices such as transducers, Intelligent Electronic Devices (IEDs), and Human Machine Interfaces (HMIs) including the low-level interfaces to these systems. Power System control issues associated with Power System Dynamics are excluded from this scope.

1. Welcome and Introductions
  - a. Introduction of our new H-SC Secretary, Dean Ouellette
  
2. Subcommittee Membership, Quorum, Signup list
  - a. Signup list – Please include name and affiliation. Add your email only if there have been any changes since the last meeting.
  - b. Determine a Quorum (H-SC Members: 45)
 

Members attending in person:	23
Members attending remote:	NA
Total Members in Attendance:	23
Quorum met (min 23)	Yes
Guests attending:	31
  
3. Approval of current meeting agenda (sent with Agenda)
 

Motion entered by:	Eric T.
Motion seconded by:	Ratan D.
Vote Result:	Yes
  
4. Approval of the minutes of previous meeting (sent with Agenda)
 

Motion entered by:	Jun V.
Motion seconded by:	Mike D.
Vote Result:	Yes
  
5. Announcements
  - a. Meeting Minutes

- i. WG officers, please help us be in compliance with our P&P procedure (6.4) by **submitting** your **WG meeting minutes within 2 weeks** of your meeting. Email these in word format to all the H SC Officers.
  - ii. To make creating your minutes a bit easier, we have included a meeting minute template at the bottom of the meeting agenda that was emailed to all Members and Guests.
  - iii. Include in your email any changes to your Meeting Room Request (MRR).
  - iv. Please report in advance if you won't be hosting a meeting.
- b. New items from May 2024 ADCOM Meeting
- i. PSRC Attendance for Buffalo NY Meetings
    - 209 In-person, 12 First Time Attendees
  - ii. The PSRC publicity working group (B5) is looking for volunteers to join this exciting team to help promote the PSRC work, activities and to help recruit future members. Please contact Cathy Dalton by email (cdalton@epri.com), text, social media post if you're interested in joining.
  - iii. The latest draft of our O&P manual as well as the current version of our P&P manuals for WG's and Standards can be downloaded from the **PSRC Knowledge center** (<https://www.pes-psrc.org/knowledgebase>)
  - iv. A reminder that the following slides must be presented or distributed in advance to WG meetings:
    - Participant Behavior ([pdf](#))
    - IEEE Copyright ([ppt](#))
    - IEEE Patent Slides ([Pre-PAR](#) or [Standards](#))
  - v. Next PSRC meetings
    - Sept 9-12, 2024 – Scottsdale, AZ (in-person)
    - Jan 12-16, 2025 – JCTM Garden Grove, CA (hybrid)
    - May 2025 – Portland, OR
    - September 2025 –
    - May 2026 -
    - September 2026 - Reno, NV
  - vi. WG Officers - If you're unable to attend an in-person meeting please recruit a WG member to help you run your session in the room, preside over the meeting and record minutes.
    - Webex Host - Instructions ([pdf](#))
    - IEEE Electronic Meeting Guide ([pdf](#))
  - vii. Looking for Webinars to publicize our PSRC work products as part of Global Outreach
    - Every WG that has completed their work is encouraged to present it to the IEEE community through WebEx which will project our work. Please contact Cathy Dalton, Chair of Publicity group or Michael Thompson, Gene Henneberg, or Jim Niemira.
  - viii. Presentations at next meeting - Upon completion of your work, WG's are encouraged to prepare a presentation to the MC. Please let Hugo Monterrubio, Mital Kanabar or Dean Ouellette know if you're interested and able to present during your reports.
- c. New items from Awards and Recognition Meeting

- i. The next PSRC awards ceremony will take place Monday September 9 at 6:00pm in Scottsdale, AZ. Please save the date!
  - ii. Standards WG awards for completed work (std published) can be requested directly in the [myProject System](#) by the WG officers
- d. Reminders carried from prior meetings:
- i. PSRC Officers have organized a Sharefile Site for WG's to store and share non-PAR documents. Please visit the **PSRC Knowledge center** to find more information or to request access to this Sharefile system.
  - ii. Report Language Usage
    - PSRC is trying to improve the quality of the documents we produce
    - Please use the IEEE SA Style manual as a resource ([pdf](#))
    - Be careful about making statements that are absolute
    - The terms “should” and “ensure” may get flagged during the balloting process
    - Be careful about the term “recommend”
6. H SC Standards Nearing Expiration (12/31/2024 or earlier):
- a. Key Dates for PAR Related SASB Meetings
    - i. 16 August 2024 (for September 2024 mtgs)
    - ii. 18 September 2024 (for October 2024 mtgs)
    - iii. 21 October 2024 (for December 2024 mtgs)
  - b. H SC Vote is required to extend PAR's so the last time to entertain a motion and have a vote is September 2024.

WG	STD	TITLE	CHAIR
H22	PC37.249	Guide for Categorizing Security Needs for Protection and Automation Related	Amir Makki
H27	PC37.251	Standard for Common Protection and Control Settings or Configuration Data Format (COMSET)	Mario Capuozzo
H40	PC37.1.2	Guide for Databases Used in Utility Automation Systems	Theo Laughner
H44	P2030.100.1	Monitoring and Diagnostics of IEC 61850 Generic Object Oriented Status Event (GOOSE) and Sampled Values Based Systems	Aaron Martin
H45	PC37.300	Guide for Centralized Protection and Control (CPC) Systems within a Substation	Ratan Das

- The last day to request a PAR extension is October 21. All work has to be completed ahead of time or an extension has to be requested. A PAR extension requires a SC motion and a vote so this would have to happen in the September meeting so consider September as your deadline.

## 7. Working Group Meeting Reports: 1.5 minutes plus voting & Q&A

WG	OUTPUT	STD	TITLE	CHAIR	YR	DRAFT
H6	Summary Paper		Application Testing of IEC 61850 based Systems	Charlie Sufana	21	1.10.23
H17	Report		Establishing Links between COMTRADE, IEC 61850, and CIM	Christoph Brunner	10	7
H22	Guide	C37.249	Guide for Cyber Security for Protection Related Data Files	Amir Makki	12	8.2
H27	Standard	C37.251	File format for IED configuration Data (COMSET)	Mario Capuozzo	13	23
H30	Report		IEC 61850 User Feedback	Depak Maragal	15	1
H31	Report		Common Protection & Control parameters for COMSET	Depak Maragal	15	10
H40	Recd Practice	C37.1.2	Databases Used in Utility Automation Systems	Theo Laughner	17	5
H41	Standard	1646	Communication Delivery Time Performance Requirements	Dave Dolezilek	17	5
H44	Guide	C2030.101.1	Monitoring & Diag IEC 61850 GOOSE and Sampled Values Based Systems  MOTION (To extend par for 2 years) Motion entered by: Dave D. Motion seconded by: Jun V. Vote Result: Yes	Aaron Martin	19	5
H45	Guide	C37.300	Guide for Centralized Protection & Control (CPC) Systems within a Substation  MOTION (modification of the scope) Motion entered by: Ratan D. Motion seconded by: Charlie S. Vote Result: Yes	Ratan Das	18	6.403
H46	Recd Practice	C37.1.3	HMI used in Substation Automation Systems	Matt Black	18	1.0
H47	Report		Investigate Impact of Digital Comms on Prot & Control Applications	Mital Kanabar	19	1.6
H49	Report		Application considerations for the Use of Packet-Switched Communication Channels for pilot protection and teleprotection schemes	Steve Klecker	20	0
H50	Report		Requirements for Time Sources in Protection & Control Systems	Dean Ouellette	19	1.7.6
H51	Standard	C37.239	COMFEDE Revision	Mark Adamiak	20	2.0
H52	Standard	C37.232	Common Format for Naming Time Sequence Data Files, C37.232, COMNAME	Ellery Blood	21	0
H53	Guide	P1854	Revision of IEEE Guide P1854 Use Guide for Smart Distribution Applications	Xiangyu Ding	21	
H54	Standard	C37.111	Revision of IEEE C37.111-2013/IEC 60255-24:2013 Standard for Common Format for Transient Data Exchange (COMTRADE)	Mark Adamiak	21	0

## Working Group Reports

### **Working Group Meeting Reports H6: IEC 61850 Application Testing**

**Chair: C. Sufana**

**Vice Chair: B. Vandiver**

**Output: Summary Paper**

**Established: January 2021**

**Assignment:** Assignment is to write a summary paper on PES-TR84 Application Testing Of IEC-61850 Based Protection and Control Systems.

Agenda H6 IEC-61850 Application Testing:

Tuesday May 14, 2024 Buffalo, NY Room: Grand Ballroom E

**3:40 PM – 4:50 PM EDT (70 Minutes)**

2:40 PM – 3:50 PM CDT

1:40 PM – 2:50 PM MDT

12:40 PM – 1:50 PM PDT

19:40 – 20:50 UTC

Assignment is to write a summary paper on PES-TR84 Application Testing Of IEC-61850 Based Protection And Control Systems.

- A. Introductions
- B. IEEE Patent slides
- C. IEEE Copyright slides
- D. Approval of previous meeting minutes
- E. Updates on IEC-61850 activities
- F. Summary paper

Voting members:

Charles Sufana, Benton Vandiver, Jay Anderson, Alex Apostolov, Christoph Brunner, Jason Buneo, Herbert Falk, Dinesh Gurusinghe, Chris Huntley, Aaron Martin, Tim Mathias, Daniel Reckerd, Antonio Riccardo, Mickey Schultz, Harsh Vardhan, Marcos Velazquez, Quintin Verzosa, Emmoji Vundekari, Austin Wade

Non-voting members

Galina Antonova, Oscar Bolado, James Bougie, Nestor Casilla, Scott Cooper, Darren De Ronde, Xiangyu Ding, Michael Dood, Didier Giarratano, George Gresko, Sughosh Kuber, Richard Liposchak, Deepak Maragal, Daniel Nordell, Silvio Roesler, Dustin Tessier

You can find the technical report at: [http://www.pes-psrc.org/kb/published/reports/H6\\_17.6\\_Application\\_Testing\\_of\\_IEC\\_61850\\_Based\\_Systems.pdf](http://www.pes-psrc.org/kb/published/reports/H6_17.6_Application_Testing_of_IEC_61850_Based_Systems.pdf) and at [Application Testing of IEC 61850 Based Systems \(ieee-pes.org\)](http://www.ieee-pes.org)

This meeting was in-person with 5 voting members and 5 non-members present.



Main emphasis of the session was to review the last of the comments from the H subcommittee vote on the summary paper draft. The latest draft was reviewed by everyone and there were a few minor changes. The feeling was that it is now ready to proceed to the next step with what is now H6\_Draft\_PES-TR84\_PES\_SUMMARY\_PAPER\_Rev\_57.docx.

The working group will meet at the next PSRC meeting to go over the summary paper. For the next meeting, we will meet in a single session in a room for 10 to 20 people, and with a computer projector.

Charlie Sufana  
H6 Chair

Voting members attending: 5 out of a total of 19 voting members

NAME	AFFILIATION
Charles Sufana	Retired
Benton Vandiver	ABB
Marcos Velazquez	Doble Engineering Company
Jun Verzosa	Doble Engineering Company
Austin Wade	SEL

Non-voting members attending: 0 out of total of 16 non-voting members

NAME	AFFILIATION

Non-members attending 5

NAME	AFFILIATION
Yohann Beaulieu	Hydro-Quebec
Timothy Erwin	GE Vernova
Hugo Monterrubio	Hubbell
Ravindranauth Ramlachan	GE Vernova
Andre Souza	Omicron

### **H17: Establishing links between COMTRADE, IEC 61850 and CIM**

**Chair: C. Brunner**

**Vice Chair: A. Apostolov**

**Output: Report**

**Established: 2010**

**Expected completion date:**

**Assignment:** Develop a standard approach to link IEC 61850, CIM and COMTRADE so that the COMTRADE channels can be associated to a node in the power network.

– H17 did not meet in May. Work has been completed.

## **H22/C19: Guide for Categorizing Security Needs for Protection Related Data Files**

**Chair: Amir Makki**

**Vice Chair: Cesar Calix**

**Secretary: Hugo Monterrubio**

**I-Meet Administrator: T.W. Cease**

**Output: Guide - PC37.249**

**Established: January 2014**

**Expected Completion Date: December 2022**

**Expected Final Draft: 8.20**

**Assignment:** Identify and categorize protection, automation and control (PAC) related data files based on content, use, and risk of disclosure or compromise (confidentiality, integrity, and availability). Protection and automation related data files include, but are not limited to, files used for configuration, management, and analysis of protective relaying systems.

– H22 did not meet in May. Work has been completed. WG will ask to be disbanded in September.

## **H27 PC37.251, Standard for Common Protection and Control Settings for Configuration Data Format (COMSET)**

**Chair: Mario Capuozzo**

**Vice Chair: Benton Vandiver**

**Secretary: Dan Sabin**

**Output: Standard**

**PAR Approval Date: 05 Feb 2016**

**PAR Expiration Date: 31 Dec 2024**

**Status: Initial IEEE SA Ballot (Closed on 2023 June 20)**

**Assignment:** Develop a standard file format for exchange of protection and control configuration data between engineering tools and asset management tools

**Call to Order:** The meeting was called to order by Chair Mario Capuozzo at 10:42 AM. Meeting minutes were recorded by Dan Sabin.

**Quorum:** 15 people attended, 4 of which were online. 9 of the 11 voting working group members were present, which established quorum.

**Required IEEE SA Slides:** The slides for essential patents, copyright policy, and participant behavior were presented by Dan Sabin. No possible essential patents were identified.

**Comment Resolution:** There are three technical comments remaining to be resolved. One of the comments proposes the addition of a schema definition file (XSD) that would define the rules and constraints for a COMSET file.

The project plan is to complete the changes within three weeks and begin a recirculation ballot around June 10. Comment resolution (if needed) of the recirculation ballot would be in July.

**Next Meetings:** If needed, the next in-person meeting of the H27 PC37.251 Working Group would be on Tuesday, September 10.

**Adjournment:** The meeting adjourned at 11:11 AM.

**Action Items:**

- The chair will complete a redline draft and comment resolution spreadsheet, and then will initiate a recirculation ballot.

**Attendee List:**

First Name	Last Name	Affiliation
Alex	Apostolov	OMICRON
Yohann	Beaulieu	Hydro-Québec
Ellery	Blood	Schweitzer Engineering Labs
Mario	Capuzzo	Doble Engineering Company
Herb	Falk	OTB Consulting
Shane	Haveron	Ametek
Theo	Laughner	Lifescale Analytics
Deepak	Maragal	LND Technical Services
Andre	Melo	Schneider Electric
Hugo	Monterrubio	Hubbell
Paul	Myrda	EPRI
Benton	Vandiver	Hitachi Energy
Marcos	Velazquez	Doble Engineering Company
Jun	Verzosa	Doble Engineering Company
Malia	Zaman	IEEE SA

**H30: IEC 61850 User Feedback Task Force Meeting Minutes**

**Chair: D. Maragal**

**Vice Chair: D. Tessier**

**Secretary: A. Martin**

**Output: User Feedback to IEC 61850 TFUF, UCA, TISSUE Task Force & Vendors**

**Established: September/2014**

**Estimated Completion Date: Ongoing**

**Assignment:** Collect user feedback from utilities and consultants for designing and implementing IEC-61850 based substation automation system. Prepare a report outlining the experienced issues and suggest enhancements to IEC-61850 standard and manufacturer implementations.

Meeting conducted with 20 attendees

The chair shared the H30 scope and discussed the following 2 topics:

1. Continuation of discussion on gaps with **IEC 61850 Revenue Meters**
2. Review of Lockout functionality within IEC 61850 and the proposal with GAPC

Chair chaired the gaps with

- Impact of Sampling Frequency and Revenue Meter accuracy
- Normative Requirements for Calibration of Merging Unit and Revenue Meter
- Normative Requirements for Stamp and Seal of Merging Unit, Communication, and Revenue Meter
- Best Practices and Guides

Group members suggested that the H30 may not be right forum to make any suggestions on the this topic which are outside the scope of PSRC/H-subcommittee. There was a suggestion to form a new IEEE TaskForce to review and work on this topic.

SEL representative (Jay Anderson) reviewed lockout (86) implementation with IEC 61850-7-500's with PTRC and offered alternate implementation with GAPC. Concerns related to block closing and remote closing functionalities were discussed. The chair made suggestion to review this topic further and offer concrete feedback with IEC 61850 UFTF for consideration/improvement.

Attendees list:

<b>Name</b>	<b>Affiliation</b>
Deepak Maragal (Chair)	LND Technical Services
Dustin Tessier	Tesco Automation
Alex Apostolov	Omicron
Greg Hatawayr	Burns and McDonalds
Shane Haveron	Ametek
Jay Anderson	SEL
Karen Wyszczelski	SEL
Yohann Beaulieu	HydroQuebec
Daniel Sabin	Schneider Electric
Criag Marien	EverSource
Andre Melo	Schneider Electric
Xiangyu Ding	S&C
Paul Myrda	EPRI
Jose Ruiz	Doble
Ravindranath Ramlachan	GE
Jim Verzosa	Doble
Herb Falk	OTB Consulting
Alexandra Piatniczka	Schneider Electric
Mohammad Hamid	Black and Veatch
Charles Pestell	
Abu Zahid	Hydro One

**H31: Common Protection & Control parameters for COMSET**

**Chair: D. Maragal**

**Vice Chair: A. Apostolov**  
**Output: Report**  
**Established: September 2015**  
**Estimated Completion Date: September 2022**  
**Draft: 6**

**Assignment:** Develop generic models and parameters for protection & protection related parameters.

Meeting conducted with 8 members and 3 guests

The group discussed the following items:

- Proposal to include Mxxx logical nodes to represent analog and binary inputs/outputs. There was consensus to include these items however Alex mentioned to represent this in a hierarchical manner with Physical IO, Logical IOS, TVTR/TCTR, Mxxx logical nodes. Alex will present the architecture in the next meeting.
- The group reviewed the signal list and settings of SEL's alpha plane characteristics. The attributes related to 2<sup>nd</sup>, 5<sup>th</sup> harmonic blocks were considered worth capturing with PHIZ or PHAR logical nodes. The group will work further to identify all parameters and include this in the working group list
- S&C electric mentioned that the existing RREC (Reclosing) model lacks the parameters for representing Intellirupter's pule closing parameters. They would work to add this in the H31 working group model.

S.No	Name	Affiliation	Membership
1.	Deepak Maragal	LND Technical Services	C
2.	Alex Apostolov	Omicron	VC
3.	Randy Hamilton	Basler	G
4.	Xiangya Ding	S&C	M
5.	Priyanka Nadkar	SEL	M
6.	Hugo Monterrubio	Hubbell	G
7.	Andre Melo	Schneider Electric	M
8.	Jose Ruiz	Doble	M
9.	Charles Pestell		G
10.	Daniel Sabin	Schneider Electric	M
11.	Jun Verzosa	Doble	M

#### **H40: Databases used in SAS**

**Chair: T. Laughner**  
**Vice Chair: M. Capuozzo**  
**Output: Guide**  
**Established: 2017**  
**Expected completion date: December 2022**  
**Draft: D2**

**Assignment:** Develop IEEE Std C37.1.2, IEEE Recommended Practice Guide for Databases Used in Utility Automation Systems

– H40 did not meet in May. Work is almost complete. WG is in ballot resolution.

#### **H41: Revision of IEEE 1646 Communication Delivery Time Performance Requirements**

**Chair:** D. Holstein

**Vice Chair:** T.W. Cease

**Output:** Standard

**Established:** 2017

**Completion Date:** 2025

**Draft:** 5E4

**Assignment:** Revision to IEEE Standard 1646-2004

– No minutes for this meeting –

#### **H44: P2030.100.1 Guide for Monitoring and Diagnostics of IEC 61850 GOOSE and Sampled Values Based Systems**

**Chair:** Aaron Martin

**Vice Chair:** David Dolezilek

**Secretary:** Jose Ruiz

**Output:** Guide

**Established Date:** 2018

**Expected Completion Date:** 2024

**Current Revision:** 5.6

**Assignment:** Write a IEEE guide titled “Monitoring and Diagnostics of IEC 61850 GOOSE and Sampled Values Based Systems”.

**Scope:** This guide provides information about what factors to consider when applying IEC 61850 GOOSE and Sampled Values to monitor and diagnose communication of automation systems.

**Purpose:** To provide guidance to protection & automation engineers when applying monitoring features IEC 61850 GOOSE messages and Sampled Values to support the implementation of condition-based maintenance, cyber security monitoring and improved commissioning of communications of automation systems.

A total of 10 members and 7 guests were at this meeting. The minimum quorum requirement of 8 was met.

Aaron Martin, working group chair, conducted the meeting remotely.

Quorum was established, a motion to approve the last minutes of the meeting was made by David Dolezilek (first) followed by Herb Falk (second). Meeting minutes were approved.

Patent, IEEE guidelines and code of conduct, and copyright slides were shown to attendees.

The current document draft version is 5.6.

Aaron asked Herb and Karen Legget-Wyszczelski to share their last contribution to the document.

A draft copy of the document was presented, and Herb explained that the document has been restructured.

Discussion of the new contribution and associated graphic was led by Herb.

David Dolezilek, working group vice-chair, reminded the meeting attendees that in the last meeting it was discussed by others that it would be useful to separate diagnostics from monitoring. Dolezilek pointed out that this could be accomplished by adding another arrow to the graphic indicating that in some instances that action may be only to send an alert of failure and not continue to use diagnostic information to troubleshoot the problem. Herb acknowledged this suggestion as a contributor of this section.

Scott Mix mentioned that the right side in Figure 1, it should be changed from alert to notify. Herb took note to make this change as a contributor to this section of the document.

Herb also mentioned that the SCL file concept was missed at the beginning of this document, and now it is included.

Dean asked if it is expected that all IEDs provide a minimum of monitoring, to which Herb clarify that it is not the case.

WG chair made edits to the document during the meeting base on the WG participants' feedback.

Aaron acknowledged Craig Preuss helped restructuring the document during this year. Craig also wrote about the relationship between diagnostic and monitoring. Herb and Karen contribution was also added to the latest draft version of the document.

A small WG team has been meeting biweekly to work on the document structure. This team is closed to share a clean document version to the WG group members for comments.

During the meeting, IEEE representative advised to the WG that the PAR is expiring at the end of the year.

Aaron asked to the WG attendees for wording to extend the PAR. The PAR extension is to give us time to work on the internal comments before going to ballot.

Scott, David, and Herb suggested the following wording: working group reviewed the entire document and identified the need for major reorganization of the content. Reorganization is

very close to be completed. Once completed, the document will be circulated to the WG members for comments. We expect to go to ballot in 2025.

David made a motion to extend the PAR (first) and Scott followed it (second).

Meeting adjourned a few minutes past the time and a motion was not necessary to adjourn it.

**Future Meeting:** For future meetings, WG H44 will need a room for 25 people with supporting projector.

**Conflicts:** Avoid conflict with WG H45.

### Attendee List (\*\*Names and affiliation only, no emails\*\*)

<b>Voting Members (15)</b>		
<b>NAME</b>	<b>AFFILIATION</b>	<b>ATTENDANCE</b>
Aaron Martin	BPA	X
Alex Apostolov	Omicron	
Benton Vandiver	Hitachi	X
Bruce Muschlitz		
Craig Preuss	Black and Veatch	
David Dolezilek	SEL Inc.	X
Dean Ouellette	Quanta Technology	X
Dustin Tessier	Tesco	
Eugenio Carvalheira	Omicron	
Herbert Falk	Outside the Box	X
Jose Ruiz	Doble Engineering	X
Jun Verzosa	Doble Engineering	X
Karen Legget-Wyszczelski	SEL Inc.	X
Nestor Casilla	Doble Engineering	X
Scott Mix	PNNL	X
<b>Non-Voting Members (3)</b>		
Arun Shrestha	SEL Inc.	
Emmoji Vundekari	GE	
Ryan Newell	TRC Companies	
<b>Guests and Past Guests</b>		
Abel Gonzalez		
Alexander Praticzka	Hitachi Energy	
Amin Banaie	GE	
Andre Melo	SE	
Andre Uribe	Power Grid Engineering	
Angelo Tempone	Duke Energy	
ArundoDai Chanda	Burns & McDonnell	
Athula Rajapakie	University of Manitoba	X



Bharat Nalla	SEL Inc.	
Byungtae Jang	Naver	
Charles Pestell	Powell	
Christoph Brunner	It4power	
Dan Ransom	GE	
Daniel Lebeau	Hydro-Quebec	
Daniel Nordell	Xcel Energy	
Daqing Hou	SEL	
Darren DeRonde	Tesco Automation	
Dinesh Gurusinghe	RTDS	X
Duruv Patel	Bechwith Electric- Hubbell	
Emmoji Vunderkari	GE	
Farzad Khalilpour	GE	
Fernando Calero	SEL Inc	
Galina Antanova	Hitachi Energy	
Gayle Nelms	SEL Inc.	
Greg Zweigle	SEL Inc.	
Hani Al-Yousef	Eaton	
Hugo Monterrubio	Hubbell / Beckwith	
Jack Wilson	Ameren	
James Formea	EATON	X
Jay Anderson	SEL	
Jay Shumar	Hitachi Energy	
Jeff Dagle	PNNL	
Jeff Pack	Power Engineers	
Jesse Sliva	SCE	
Jim Hackett		
Joe Xavier	ABB	
Joel Green	SISCO	X
Jorg Blumshein	Siemens	
Jorge Cinton	USNRC	
Kevin Malpede	ComEd	X
Marcos Velazquez	Doble Engineering	
Mario Capuozzo	Doble Engineering	
Matt Black	Sargent Lundy	
Michael Cummingham	Power Grid Engineering	
Mike Basler	Basler Electric	
Mike Dood	SEL	X
Mital Kanibar	GE	
Mohit Sharma	SEL	
Nelson Perilla-Sanchez	NCS	
Nicholas Kraener	National Grid Power	
Nuwan Perera	Earlphase	
Orville		
Pail Myrda	EPRI	

Priyanka Nadkar	SEL Inc.	X
Rich Hunt	Quanta Technology	
Romulo Bainy	University of Idaho	
Safety Pepljak	YRC Companies	
Scott Short	Doble Engineering	
Shane Haveron	Ametek	
Shivam Prabhatkar	Siemens	
Thai Li	Hubbell	
Thomas Rudolph	SE	
Wang Zitao		
Wayne Pawley	Sisco	
Xiangyu Ding	S&C E	
Yanfeng Gong	SEL Inc.	
Yuchen Lu	EPRI	
Yujie Yin	GE	

#### **H45: PC37.300 Guide for Centralized Protection and Control (CPC) Systems within a Substation**

**Chair: R. Das**

**Vice-Chair: P. Myrda**

**Secretary: M. Kanabar**

**Expected Output: Guide**

**Established: 5/18**

**Expected Completion Date: 12/2024**

**Draft: 6.43**

**ASSIGNMENT:** Develop a guide for Centralized Protection and Control (CPC) Systems within a Substation

#### **(In Person) Meeting # 55 (May 15, 2024) Notes**

The working group met on May 15, 2024 with 32 attendees - 9 of them are voting members (out of 29) and 23 guests. The names and affiliations of attendees are enclosed in Annex I.

Chair presided over the meeting. Secretary helped with checking quorum and taking meeting notes. IEEE SA patent, copyright and participant behavior policy and other guidelines for working group meetings were reviewed.

Quorum was not achieved throughout the meeting. Proposed agenda as in Annex II was used for the meeting.

Chair informed that notes of the last WG (virtual) meeting (May 03, 2024) circulated via email dated May 05, 2024, were approved without any changes. No further comments were received during this meeting. Chair also informed that the motion for minor scope modification circulated

with the meeting notes also received the required approval and will be presented to H-Subcommittee for approval. Some members provided comments on the second motion and officers decided to hold off the second motion till the ballot recirculation process is complete.

Chair provided the status of progress of the WG the for the benefit of non-member participants at the meeting. Draft 6.4 was used for IEEE Initial Ballot which closed on August 2, 2023. Ballot return rate was 80% (128 out of 160) - over the required threshold of 75%. Ballot approval rate was 88% (105 out of 119) - over the required threshold of 75%. There were nine abstentions (7%) – below the required threshold rate of 30%. IEEE Initial Balloting received 1309 comments – 911 Editorial and 398 General/Technical Comments. A total of 799 comments out of 1309 comments were indicated as ‘must be satisfied’.

Chair informed that WG membership has been meeting virtually since August 11, 2023 to discuss and dispose comments. WG voting members so far unanimously agreed on disposition of all but one comment (I-1042). The remaining comment will be send to members for approval via email as soon as the new write-up is received. Chair also provided the summary statistics for ballot dispositions – 42% comments have been accepted, 51% of the comments have been disposed as “REVISED” and only 7% of the comments have been rejected.

Chair also informed that the updated draft version 6.43 and the comments disposition details in the Excel file were shared with IEEE SA coordinator along with balloters who provided impactful comments. The goal is to resolve the comments before formal recirculation. Comments from SA coordinator and one balloter have been received and will be addressed during the next update of the comments disposition file and the draft. Comments from IEEE SA editor have also been received on Draft 6.43 and the reordered bibliography which will be addressed during the next update.

Discussion was then held on the use of inclusive words. The proposal agreed during the last meeting to replace master and slave clocks was discussed in view of comments received from Craig about the replacement terms mentioned in IEEE 1588G-2022. Some of the participants wanted to know whether IEEE SA mandated the use of inclusive words. Chair mentioned that he will follow up with IEEE SA coordinator on this question. Chair also mentioned that it will be in the best interest of the guide to align with IEEE 1588G-2022. Chair mentioned that officers will discuss this topic and a proposal will be sent to members for approval.

Chair mentioned that comments disposition process is almost complete – the updated version of the draft will be send to the members along with the updated comments disposition file for approval, after receiving comments from other balloters, to initiate the IEEE Ballot Recirculation 1.

WG plans to meet during the September 2024 PSRC meeting to share the status of the guide after ballot recirculation(s). Chair will convene WG membership meeting before September, if required.

Meeting was then adjourned.

Sincerely,

Ratan Das   Paul Myrda   Mital Kanabar

IEEE PSRC WG H45 May 15-2024 Meeting (#55) Attendees					Annex I
#	Role	First Name	Last Name	Affiliation	Present
1	Chair	Ratan	Das	GE Vernova, USA	Yes
2	Vice-Chair	Paul	Myrda	EPRI, USA	Yes
3	Secretary	Mital	Kanabar	GE Vernova, Canada	Yes
5	Voting Member	Jay	Anderson	SEL, USA	No
6	Voting Member	Bruno	Andre	Schneider Electric, France	No
4	Voting Member	Alexander	Apostolov	Omicron Electronics, USA	Yes
7	Voting Member	Joerg	Blumschein	Siemens, Germany	No
8	Voting Member	Ritwik	Chowdhury	SEL, USA	No
9	Voting Member	Mohammad	Dadash Zadeh	ETAP, USA	No
10	Voting Member	Richard	Hunt	Quanta Technology, USA	No
11	Voting Member	Erin	Jessup	SEL, USA	Yes
12	Voting Member	Jack	Jester	Exelon, USA	Yes
13	Voting Member	Chikashi	Komatsu	Hitachi, Japan	No
14	Voting Member	Raluca	Lascu	DTE, USA	No
15	Voting Member	Yuan	Liao	U of Kentucky, USA	No
16	Voting Member	Vahid	Madani	GridTology, USA	No
17	Voting Member	Sakis	Meliopoulos	Georgia Tech, USA	Yes
18	Voting Member	Hugo	Monterrubio	Beckwith, USA	Yes
19	Voting Member	Bharat	Nalla	Amazon, USA	No
20	Voting Member	Damir	Novosel	Quanta Technology, USA	No
21	Voting Member	Craig	Preuss	Black & Veatch, USA	No
22	Voting Member	Qun	Qiu	AEP, USA	No
23	Voting Member	Jean	Raymond	Hydro-Quebec, Canada	No
24	Voting Member	Thomas	Rudolph	Schneider Electric, Germany	No
25	Voting Member	Jose	Ruiz	Doble, USA	No
26	Voting Member	Arun	Shrestha	SEL, USA	No
27	Voting Member	Harsh	Vardhan	GE Vernova, USA	No
28	Voting Member	Austin	Wade	SEL, USA	Yes
29	Voting Member	Joemoan	Xavier	ABB, USA	No
30	Non-Voting Member	Philip	Beaumont	Retired, United Kingdom	No
31	Non-Voting Member	Robin	Byun	BPA, USA	No
32	Non-Voting Member	Evandro	De Oliveira	Siemens, USA	No
33	Non-Voting Member	Yuri	Luskind	Consultant, Canada	No
34	Non-Voting Member	Mohindar	Sachdev	U of Saskatchewan, Canada	No
35	Non-Voting Member	Jeff	Shiles	SCE, USA	No
36	Non-Voting Member	Donald	Ware	Power Grid Engineering, USA	No
37	Non-Voting Member	Qiaoyin	Yang	Tsinghua University, China	No
Total					9

<b>Guests</b>			
<b>#</b>	<b>First Name</b>	<b>Last Name</b>	<b>Affiliation</b>
1	Yohann	Beaulieu	Hydro-Quebec
2	Fernando	Chandra	Eaton Corporation
3	Wayne	Hartmann	GE Vernova
4	Greg	Hataway	Burns & McDonnell
5	Chris	Huntley	SEL
6	Jeysson	Gonzalez	S&C Electric
7	Daniel	Khoroshansky	ENTRUST
8	Hillmon	Ladner	Southern Company
9	Matthew	Leyba	GE Vernova
10	Deepak	Maragal	LND TS
11	Craig	Marien	Eversource
12	Todd	Martin	Basler Electric
13	Andre	Melo	Schneider Electric
14	Gale	Nelms	SEL
15	Jeff	Pack	
16	Alexandre	Piatniczka	Schneider Electric
17	Priya	Raghuraman	Siemens
18	Ravindranauth	Ramlachan	GE Vernova
19	Dan	Sorensen	National Grid
20	Jonathan	Sykes	Quanta Technology, USA
21	Justin	Turner	GE Vernova
22	Eric	Thibodeau	Hydro-Quebec
23	Marcos	Velazquez	Doble
		Total	23

#### **H46: Recommended Practice for Human-Machine Interfaces (HMI) used in Substation Automation Systems (PC37.1.3)**

**Chair:** Matt Black

**Vice Chair:** Craig Preuss

**Secretary:** Shane Haveron

**Output:** Recommended Practice for Human-Interfaces (HMI) used with Electric Utility Automation Systems (PC37.1.3)

**Established:** September 2018

**Expected Completion Date:** December 2025

**Draft:** v1.0

**Assignment:** Produce a Recommended Practice for Human-Machine Interfaces (HMI) used with Electric Utility Automation Systems

The chair called the hybrid meeting to order on Wednesday 5/15/24 at 9:20 EDT. There were 10 attendees: 5 out of 14 voting members and 5 guests, not achieving a quorum.

After introductions, the agenda, patent, copyright, and participant slides were reviewed with no comments received. There were no presentations or Old business.

Status update was given by the chair that we had cleared the 1<sup>st</sup> round of IEEE-SA balloting with a 97% approval rate. The votes included near unanimous approval votes, with one abstention & only 1 disapproval with comments. We received 42 comments from the 1<sup>st</sup> round of balloting with 1 general, 22 editorial, & 19 technical comments. We are optimistic that said comments can be worked-off with 1-2 virtual sessions & a recirculation completed prior to the September '24 meeting.

The WG spend the balance of our time as a Ballot Resolution Group addressing the comments (specifically technical comments) one by one. Many were initially rejected due to no change being proposed with just a “generalized” comment to say something *should* be done. Consideration will be given to reaching out to the balloter to expand on said comments or withdraw said comments.

At the next meeting we will request room for 25 with a projector. Please avoid conflicts with I31, J24, H27, H51, H52, & S15.

**Meeting Minutes**  
**May 14, 2024**  
**Buffalo NY USA**

**H47: Investigate Impact of Digital Comms on P&C Applications**

**Chair:** M. Kanabar  
**Vice Chair:** A. Riccardo  
**Secretary:** D. Ouellette  
**Output:** Report  
**Established Date:** 05/2020  
**Expected Completion Date:** 12/2025  
**Current Revision:** 1.6.1

**Assignment:** Generate a report evaluating the discrepancies in the communication of SV, GOOSE or PTP messages and their impact on protection and control applications such as performance and behavior.

The WG met on Tuesday, with 8 members and 6 guests in attendance. A quorum was not present. Attendees introduced themselves and affiliation.

Attendees signed the attendance list and indicated if they were a member or guest.

The call for patents was presented – no response.

The agenda was reviewed without change.

Past minutes were not reviewed.

Those attending focused on the following topics:

1. Review of current draft.
2. Review of items removed from present draft to see if anything should be moved back into the draft.
3. Section added to handle human errors during testing (Daniel Lebeau).
4. Priya Raghuraman to redraw graphic about differences between process bus and station bus.
5. References from each section to be put into a bibliography.
6. Austin Wade would like to contribute on items that are missing content.
7. Daniel Lebeau will present a topic on testing during next face to face meeting.

## Attendee List

<b>Members</b>	
<b>NAME</b>	<b>AFFILIATION</b>
Mital Kanabar, Chair	GE Vernova
Dean Ouellette	Quanta Technology
Daniel Lebeau	Hydro Quebec
Chris Huntley	SEL
Priyanka Nadar	SEL
Jorg Blumschein	Siemens
Priya Raghuraman	Siemens
Dinish Gurusinghe	RTDS
<b>Guests</b>	
Gayle Nelms	SEL
Erin Jessup	SEL
Art Buanno	First Energy
Carolina Arbona	Burns & McDonell
Souvik Chandra	Eaton
Austin Wade	SEL

### **H49: Application Considerations on the Use of Packet-Switched Communication Channels for Pilot Protection and Teleprotection Schemes**

**Chair: Steve Klecker**

**Vice Chair/Secretary: Galina Antonova**

**Output: Report**

**Completion Date: TBD**

**Current Revision: N/A**

**Assignment:** To develop a report on application considerations and experiences on the use of packet-switched networks from a teleprotection application point of view for the benefit of relay engineers. Produce tutorial/summary presentation based on report.

– No minutes available for this meeting –

### **H50: Requirements for Time Sources in Protection and Control Systems**



**Chair:** Dean Ouellette  
**Vice Chair:** Jay Anderson  
**Secretary:** None  
**Output:** Report  
**Established Date:** May 2019  
**Expected Completion Date:** 12/31/2022  
**Draft:** 1.7.4 20231221

**Assignment:** Presently there are IEEE and IEC standards around (accurate) time distribution systems (for example, IEEE 1588 and associated Profiles, IEEE/IEC 61850-9-3, etc.). The intent of this Report is to document requirements for Time Sources (Clocks) used in Protection and Control Systems.

– No minutes available for this meeting –

#### **H51: Revision of C37.239-2010 Standard on a Common Format for Event Data Exchange (COMFEDE)**

**Chair:** Mark Adamiak  
**Vice Chair:** Pierre Martin  
**Secretary:** Zach Makki  
**Output:** Standard Revision  
**Completion Date:**  
**Current Revision:** 2010

**Assignment:** Revise the current COMFEDE standard (C37.239-2010)

- H51 did not meet in May

#### **H52: C37.232 Standard for Common Format for Naming Time Sequence Data Files (COMNAME)**

**Chair:** Ellery Blood  
**Vice Chair:** Shane Haveron  
**Secretary:** Amir Makki  
**Output:** Revision of an Existing Standard  
**Established Date:** September, 2021  
**Expected Completion Date:** December, 2024

**Assignment:** Revise the Standard. The revision to include clarification on methods of use such as use for naming folders and allowing for underscore delimiters.

- a) Ellery Blood (Chair) presiding (virtual)
- b) Shane Haveron (Vice Chair) presiding (virtual)
- c) Call to order
- d) Intellectual Property slides

- e) Chair's remarks
- f) Results of call for quorum
  - a. 5 of 8 members present (1/2 +1), quorum established.
- g) Approval of Agenda (motion and second)
  - a. Theo made the motion
  - b. Shane seconded the motion
- h) Approval of Minutes of March 2024 meeting (motion and second)
  - a. Theo motion
  - Shane second
  - b. Motion passes
- i) Discussion
  - a. Ellery – Review COMNAME draft v0.02 available on [ieeee-sa](#).
    - i. Front Matter: Introduction
      - 1. history of standard – **accepted**
      - 2. path+name length – **discussion**
        - a. **Shane to research and propose edits relating to path+name length on different operating systems and media formats (e.g., CD / DVD). Include pros and cons of limits of path length and provide recommendation.**
        - b. **Mac OS/X – 255 for name and 1024 for path**
        - c. **Linux EXT4 – 255 for name and 4096 for path**
        - d. **Windows 11 – 260 characters for path+file**
          - i. **With NTFS long paths enabled – 260 for file, 32767 for path+file**
        - e. **Compact Disc**
          - i. **ISO 9660:1999**
            - 1. **30 for file and folder names, 128 for path and depth limited to 8 nested folder.**
          - ii. **ECMA-119 4th edition June 2019**
            - 1. **Primary volume descriptor – 30 for file**
            - 2. **Enhanced file descriptor– 207 for file and folder names, no limit on total path length**
        - f. **ZIP (pkware APPNOTE-6.3.9)– 65535 for path+file**
    - ii. Section 1.2 Normative References. - **discussion**
      - 1. Add reference to ISO 80000-2 Quantities and units
      - 2. Add reference to ISO 8601 Date and Time
      - 3. Add reference to ISO 6709 Geographic Point coordinates
      - 4. Add reference to ECMA-119 CDROM file structure
      - 5. PKWare APPNOTE-6.3.9 .ZIP File Format Specification
      - 6. RFC 1951 – Deflate Compressed Data Format Specification
      - 7. Normative references should be a separate section after overview.
    - iii. Section 1.5 General:
      - 1. Can access filenames in archive without extracting – **accepted**
    - iv. Add underscore as allowed delimiter – **accepted**
      - 1. General philosophy is that without a schema, the new standard uses the 2011 standard but explicitly allowing underscore for delimiter. – **discussion**
        - a. Added paragraph to section 1.5

2. Section 1.5 General
    - a. Add text about compatibility – **accepted**
  3. Section 4.1 General– **accepted**
  4. Section 4.3 Required fields– **accepted**
  5. Section 4.4 user fields– **accepted**
- v. Schema
1. Section 4.1 General
    - a. Required fields are required – **accepted**
    - b. Alternate field order is allowed – **accepted**
  2. Section 4.3 Required Fields
    - a. Schema may specify 2 or 4 digit years
      - i. Should this revision stick with 2-digit year or default to 4-digit year (and a user may specify 2-digit year in the schema). - [discussion](#)
    - b. Timestamps should be in UTC (offset 0) – **accepted**
  3. Section 5 Uniqueness
    - a. Use optional fields such as Data Type to distinguish files– **accepted**
  4. Section 6 Universality
    - a. Schema shall be in XML. - [discussion](#)
    - b. Specify delimiter in schema– **accepted**
      - i. As long as comma and underscore may be used without needing a schema file.
    - c. Folder structure in schema – **accepted**
    - d. Modification to XML schema example– **accepted**
    - e. Schema versioning– **accepted**
- vi. User Fields – Section 4.4
1. Use ISO 8601 to represent durations. – [discussion](#) – [further edits](#)
    - a. More verbose than 2011 standard for duration, but does use an existing standard.
    - b. Discussion:
      - i. [This should consider how these use up characters in the file name. If significantly more verbose, should use the less verbose version.](#)
      - ii. [Make 8601 the default, but also allow 2011 standard.](#)
      - iii. [If allowing optional fields in 8601, then for short duration events, 8601 would tend to be more a more concise representation.](#)
      - iv. [Also include option to specify end time rather than duration.](#)
      - v. [Do not include language prohibiting redundant information.](#)
  2. Add examples for Data Type
    - a. Add table of examples - [discussion](#)
  3. Use ISO 6709 for geographic position coordinates
    - a. How does schema allow 2011 style location fields? - [discussion](#)

- 4. Add annex describing user fields in schema - [discussion](#)
- vii. Section 3.3 Coding Schemes - [discussion](#)
  - 1. Do we need this section?
- viii. Section 4.2 Limitations - [discussion](#)
  - 1. Do we need this section anymore?
- ix. Section 4.7 Geographic Position (latitude and longitude) - [discussion](#)
  - 1. Do we need this section?
- b. Theo – compressed / archive file
  - i. New clause (Optional: May language) on how to deal with compressed / archive type files that may contain multiple records from multiple devices. That clause would include how to organize data within the archive and how to name the archive file itself.
  - ii. Use schema file to define desired folder structure and then archive the folder structure including the schema file. Archive format needs to retain the folder structure relative to the root folder.
  - iii. Data Type = Archive / ZIP ?
  - iv. ZIP letter of assurance was explored by COMTRADE (H54) working group. Excerpt from their minutes is at the bottom of this document.
- j) Action items
  - a. Ellery - iMeet Central – members to request access to H52 workspace.
    - i. <https://ieee-sa.imeetcentral.com/h52/home>
  - b. Ellery – Status of Discussion Points.
- k) Next meeting date and location
  - a. Virtual: July via Teams/Webex
  - b. In Person: September 9 2024 PSRC meeting, Scottsdale, AZ
- l) Shane motion and Theo second to adjourn the meeting.

### **Attendance**

Members in attendance (5 of 8):

Dan Sabin  
Ellery Blood  
Jun Verzoza  
Shane Haveron  
Theo Laughter

Members absent:

Amir Makki  
Ethan Grindle  
Hugo Monterrubio

Guests (4)

Malia Zaman  
Nallan Kumar  
Eric Thibodeau  
Charles Sufana

### **Discussion Points:**

1. Zip archives – should this standard cover naming of zipped event record archives?
2. Zip archives – should this standard specify file structure for zipped event record archives?

**Under Consideration:**

1. Time Zone – support local time as offset? Assume local time if time zone field is blank?
2. Standard to further specify field parameters (e.g., length of StationID and DeviceID)?
3. Standard versioning – if no schema, is existing standard (except for 4-digit year and allowing both comma and underscore). If schema exists, schema includes standard revision year?
4. Date field – support 2 and 4 year format. Default is 4?
5. Archive technology informative annex.
6. For optional fields (duration, location) use ISO standard rather than what was defined in previous COMNAME release?
7. Schema in XML (consistent with previous standard, but with some additions).

**Resolved:**

1. Delimiter – (Shall) First non-digit character (typically 7<sup>th</sup> or 9<sup>th</sup>) in file name.
  - a. (May) Other delimiters allowed if specified in the schema.
2. Time Zone – (Should) use 0 for time zone offset (e.g., use UTC).
3. Schema for Folder Structure – (May) May use schema file to define folder structure.
4. (Shall) Required fields shall still be included even if fields are also in folder structure.
5. (May) New clause on how to deal with compressed / archive type files that may contain multiple records from multiple devices. That clause would include how to organize data within the archive and how to name the archive file itself.
6. (Shall) Separate “Type” field into “Data Type” and “Trigger Type”. Create informative language.
7. (Shall) Include schema for file name if deviating from the default.
8. (Should) use 8601 for duration and (May) use 2011 as defined in schema. May specify end time.
9. Include discussion regarding max path/name lengths in different operating systems and media?
- 10.

Regarding Zip files as a container, here is the H54 working group recording their recent discussions with PKWARE (the PKWare Deflate algorithm was protected under U.S. Patent US5051745, granted 24 September 1991. Expired on 21 August 2010):

*At the January 2024 meeting, a question was raised on whether a proposed contribution that would require the Zip specification from ISO/IEC 21320-1:2015, which in turn is based on the Zip specification from PKWARE, may require use of essential patents owned by PKWARE. As an action item, the DLMT leadership contacted PKWARE, explained the proposed use of Zip files in the revision of COMTRADE-2013, and asked them to submit a Letter of Assurance to the IEEE SA Patent Committee Administrator. The response from PKWARE was that “there is insufficient overlap to necessitate the execution of a Letter of Assurance”*

**H53/P16: Revision of IEEE Guide P1854 Use Guide for Smart Distribution Applications**

**Chair:** X. Ding, J. Lombardo  
**Vice Chair:**  
**Secretary:**  
**Output:** Guide  
**Established Date:** 09/2021  
**Expected Completion Date:** 12/2024  
**Current Revision:** 20241120

**Assignment:** Revision of IEEE Guide P1854 Use Guide for Smart Distribution Applications

**H54: Revision of IEEE C37.111-2013/IEC 60255-24:2013 Standard for Common Format for Transient Data Exchange (COMTRADE)**

**Chair:** Mark Adamiak  
**Vice Chair:** Zach Makki  
**Secretary:** Dan Sabin  
**Output:** Standard  
**PAR Approval Date:** 2022 Sep 11  
**PAR Expiration Date:** 2026 Dec 31  
**Current Revision:** IEEE Standard C37.111-2013 (IEC 60255-24 Ed.2)

**Assignment:** To complete the revision of IEEE Standard C37.111-2013 (IEC 60255-24 Ed.2) as part of an IEEE/IEC Dual Logo Maintenance Team Project.

-No minutes for this meeting

**HTF55: Distributed Cyber Physical Assessment for Grid Resilience**

**Chair:** Jeff Pack  
**Vice Chair:** Craig Rieger  
**Secretary:**  
**Output:** Report  
**Established Date:** 05/2022  
**Expected Completion Date:** 2024  
**Current Revision:** 1.0

**Assignment:** Investigate Distributed Cyber Physical Assessment for Grid Resilience and evaluate participation with other technical committees, societies, groups, and associations that may have interest.

- a) Jeff Pack, Chair, presided and took the minutes.
- b) Meeting participants

Name	Affiliation	Attendance Type (W – Web, P – Phone, L – Local)	Member - Guest
Jeff Pack (Chair)	POWER Engineers	L	M

- c) Quorum was not achieved.
- d) There were no other attendees besides the chair.
- e) Since there was no quorum, no business was conducted, and no discussion occurred.
- f) Assignment:
  - a. A draft report has been developed and will be sent to the members for e-mail discussion.
  - b. Once all comments are resolved, the draft report will be submitted to the H subcommittee leadership for review and approval.
- g) Survey Status
  - a. The survey was distributed to the PES Committee Chairs for distribution to the Committee members.
  - b. Less than ten responses were received to the survey.
- h) Literature Search
  - a. The Vice-Chair performed a Literature Search to determine the current state of advancement and application of technologies for detection, visualization, and response to distributed cyber-physical degradation of power systems. These results are summarized in the draft report.
- i) The meeting was adjourned at 1:30 P.M.
- j) The Task Force has developed a draft report and plans to submit it to the H subcommittee leadership before the Fall 2024 meetings.

**----end of working group reports----**

- 8. Old Business
  - a. None
- 9. New Business
  - a. Dave Dolezelik mentioned a motion to form a new Task Force in P0 to write a report on quality assessment, design for reliability, and risk informed decision making and their impact on communication protocols and architectures for electric power systems will be brought to the PSCC main committee for approval. This might lead to a joint TF within H SC to contribute to this report at a later date once more information is shared to H SC.

- b. HTF56 Ideation Meeting - Meeting generated 24 initial ideas. This is an initial list of some of these that can potentially generate interest to form a TF to evaluate the interest and applicability to the scope of H SC
- i. Relaying control forming grid islands, zones, using GFM control coordination
  - ii. Wide-area or zonal or relaying controls at the edge with distributed intelligence
  - iii. DER aggregator to zonal relaying controls and communication
  - iv. Virtualized relaying applications communications within unified grid control platform (UGCP)
  - v. Process bus communication practical experience, esp. MU, networks for field maintenance
  - vi. Engineering of relaying function communications, adaptive individual setting level changes from local/remote communications
  - vii. Adaptive protection & control using communication and AI technology
  - viii. Remote & Automated testing of relaying communications and controls

## 10. Adjourn

Motion entered by: Alex A.  
Motion seconded by: Matt B.



**IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda****IN-PERSON MEETING – Buffalo, NY****Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time****I SC – Protection and Control Practices****Scope:**

Evaluate and report on all matters related to protection and control practices for compatibility with the physical and electrical environment (including but not limited to equipment withstand capabilities to electromagnetic interference), characteristics and performance of instrument transformers and sensors, equipment and system testing procedures, protection and control performance criteria and applications, event/transient recording, and definitions of protection and control systems. Develop, recommend, establish, and maintain standards on protective relaying and control equipment and practices. Evaluate, report on, and develop standards on other pertinent aspects of protective relaying and control systems not addressed by other PSRC Subcommittees.

1. Welcome and guidelines for meeting
  - a. Sign-in sheet is being passed around. Member names are listed. If your information has changed, please update it in the sign-in sheet.
2. Recognitions:
  - a. Attendee introductions
  - b. Thank guests for attending
3. Many thanks to former members of the I-SC:
  - a. None
4. Welcome to new members of the I-SC:
  - a. None
5. Determine a Quorum (**39 members** total in I-SC)
  - a. Attendance: 20 (min 20 for quorum; YES  or NO )
6. Approval of current meeting agenda
  - a. Motion entered by: Hugo Monterrubio
  - b. Motion seconded by: Eric Udren
7. Approval of Minutes of the January 10, 2024, meeting
  - a. Motion entered by: Austin Wade
  - b. Motion seconded by: Sudarshan Byreddy
8. Coordination & Advisory Committee Meetings Items of Interest
  - a. Attendee information (approximate): *209 in-person PSRC attendees*
  - b. *Future Meetings – See “Future Meetings” page on PSRC website:*
    - *September 2024 – Scottsdale, AZ*
    - *January 2025 (JTCM) – Garden Grove, CA*
    - *May 2025 – Portland, OR*
    - *September 2025 – Cleveland, OH (tentative)*
  - c. **PSRC B5 Publicity Working Group meeting from September 2024 is open to all and is looking for volunteers. If you are passionate about recruiting new members to the PSRC, contact Cathy Dalton ([cdalton@epri.com](mailto:cdalton@epri.com)).**
  - d. Policies and Procedures for: Power System Relaying and Control Committee Working Group—see PSRC Knowledge Base—review regularly for updates
    - **P&P 2022 now available and O&P 2023 version (Draft approved 2023-09-21) soon available in <https://www.pes-psrc.org/knowledgebase/>!**
    - Three officers: Chair, Vice-Chair, and Secretary
    - All WG Officers shall be members of IEEE SA

## IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

### IN-PERSON MEETING – Buffalo, NY

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- e. Working Group sign-in sheets – use confidential procedure!!!
    - See instructions on PSRC website for how to create your Working Group roster and attendance list for handout at your meeting. Email addresses are no longer permitted to be placed on your sign-in sheet. Attendees must add their email address when they register for PSRC meetings.
    - Use a spreadsheet to maintain attendance records. Use BCC on email correspondence to maintain confidentiality of user contact information. Attendance roster should contain name and affiliation, but not email addresses, phone numbers, or other contact information. Begin using new Member Planet Association Management System when available. This allows you to be on the relevant mailing lists. This system will also be used for registration for future meetings.
  - f. For PAR-related work, present the new patent slides and *record in your minutes* whether essential patent claims exist. If there are none, please write this into the minutes. Do this at every working group meeting. New JUNE 2021 slides available and are at <http://standards.ieee.org/about/sasb/patcom/materials.html>. To expedite your meeting, send the slides with the meeting agenda so meeting attendees can review ahead of time.
  - g. Looking for Webinars to publicize our PSRC work products as part of Global Outreach
    - Availability of WebEx for presentations by IEEE. Every WG that has completed their work is encouraged to present it to the IEEE community through WebEx which will project our work. Please contact Cathy Dalton, Chair of Publicity group or Michael Thompson, Gene Henneberg, or Jim Niemira.
  - h. **Looking for presentations for future Main Committee meetings** – please contact Ritwik Chowdhury or Jim Niemira.
  - i. The PSRC Committee is international and open to anyone who cares to attend.
  - j. New “Awards” page on PSRC website—with pictures of recent awards ceremonies
9. Administrative Items
- a. From IEEE-SA: WG/TF Agendas and Minutes: “The 14-calendar-day rule” – the Standards Association requirement in O&P
  - b. Procedure for PARs:
    - All PAR related activities must be approved by the PSRC Main Committee members, although certain activities are now delegated to the Subcommittee
    - Request slides and receive guidance from our standards coordinator ([standards@pes-psrc.org](mailto:standards@pes-psrc.org)) on how to request at the Main Committee – a Working Group Chair makes a motion at the Subcommittee meeting for the SC Chair to create a slide and then send it to the Main Committee Officers for inclusion on the slide set at the Main Committee meeting. The SC Chair reads the motion(s)
    - Create new PAR for new standard – MC
    - Create new PAR for existing standard without major changes to scope – SC; with changes to scope – MC
    - Approval to proceed to IEEE-SA for creation of a balloting body or to proceed to sponsor ballot – SC
    - Minor changes to statements of PAR title, scope and/or purpose without change of scope – SC; Changes to PAR scope – MC

## IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

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- Working group submits to the Subcommittee the new or revised PAR, scope, purpose, minutes of their meeting, attendees, their affiliations, any disagreements are noted in the minutes.
- Actions at SC level (i.e., motions approved or disapproved) are reported to MC; motions requiring action of the full MC are brought to the MC floor by the SC Chair.
- The Subcommittee reviews it, and then the SC Chair submits the PAR/name/ID number and reason for approval to the Main Committee Secretary to put in the slide deck. The slide is displayed while the SC Chair reads the request to the Main Committee members. A vote is then taken.
- Motion to approve the new or modified PAR is done at the Main Committee meeting (or if done at the SC, will be reported to the MC by the SC Chair).
- PSRC Committee is the Sponsor
- myProject™ Volunteer User Guide – good stuff  
[https://mentor.ieee.org/etools\\_documentation/dcn/11/etools\\_documentation-11-0014-MYPR-myproject-user-guide.pdf](https://mentor.ieee.org/etools_documentation/dcn/11/etools_documentation-11-0014-MYPR-myproject-user-guide.pdf)
- c. Review Draft 1 of the PSRC meeting agenda as soon as the meeting notice arrives in your inbox – to avoid meeting conflicts and multiple agenda revisions. Contact Angelo Tempone and Ritwik Chowdhury for your requested changes – we will consolidate them and forward to Jim Niemira.
- d. As Chair/Vice-Chair/Secretary of WG/TF, please contact Ritwik Chowdhury and Angelo Tempone *if you cannot attend your session*. Delegate to another member of your WG to preside at the meeting and record minutes.
- e. Non-PAR-related document drafts can be shared with anyone who is interested. Please add a note that this is a draft version subject to change. Once this document is complete and approved, it will be posted on PSRC Knowledge Base (<https://www.pes-psrc.org/knowledgebase>) which is open to all and/or published on the PES Resource Center (<https://resourcecenter.ieee-pes.org/>).
- f. All PAR-related document (IEEE related) drafts may not be forwarded by the WG member to anyone else – there is a public review period for all IEEE documents where anyone can submit their comments.
- g. When submitting “comments resolution” CSV file back to IEEE-SA in myProject, make sure that your draft is updated to reflect all the changes made – must match up to the CSV file!
- h. *iMeet Central* (formerly Central Desktop) is to be used for IEEE Guide / Recommended Practice / Standard documents with a PAR
- i. PSRC has File Share facility for non-PAR documents. Contact Ritwik Chowdhury (I-SC Chair) if your group has need or interest. Need list of participants with email addresses to allow write access - typically only a few people (WG Chair, VC, and/or Secretary); view access can be granted to others. See instructional videos on PSRC Website.
- j. Standards WG Awards - The IEEE Standards Association Working Group Awards has a new Procedure to request certificates of appreciation for completed (Approved Standard) work.

## IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

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- WG Chair or WG VC must request certificates directly from the IEEE-SA in myProject. Awards can be shipped to our next PSRC meeting hotel for announcement and distribution or can be shipped to the requestor.
  - You will need a list of WG Officers and Members; and shipping address. If shipping to the hotel for the next meeting, send to attn of Awards Chair Andre Uribe, verify the address, and be sure they arrive prior to the Monday of the meeting.
  - Awards Ceremony will be at Monday night reception dinner for all PSRC Meetings in May and September (not January). Please consider this when making travel arrangements. Don't miss the opportunity to recognize your colleagues or to be recognized yourself!
- k. Reports/Paper Final Output – To be considered for PES level award the output of all Working Groups with a Technical Output including Technical Reports, Transactions / Journal and conference papers must be completed in PES Format and submitted and posted in the PES Resource Center. Final Draft of PSRC Reports, without PES Resource publication number or cover, will also be posted to PSRC Website.
- l. Links to PES:
- PES Technical Resource Center: <http://resourcecenter.ieee-pes.org/>
  - PES Technical Activities Resources and templates: <https://www.ieee-pes.org/technical-activities/committees/resources>
  - PES - Technical Report Template: [https://www.ieee-pes.org/images/files/doc/tech-council/PES-Technical-Report-Template\\_Jan\\_2019.docx](https://www.ieee-pes.org/images/files/doc/tech-council/PES-Technical-Report-Template_Jan_2019.docx)
  - PES - Technical Paper Template: <https://www.ieee-pes.org/templates-and-sample-of-pes-technical-papers>
  - PES Resource Center Submission Checklist with instructions on how to get your report or Paper submitted please use this link: [http://ieee-pes.org/images/files/doc/tech-council/Submission\\_Checklist\\_PES\\_Resource\\_Center.docx](http://ieee-pes.org/images/files/doc/tech-council/Submission_Checklist_PES_Resource_Center.docx)
- m. Email WG/TF Minutes to Angelo Tempone at: [angelo.tempone@duke-energy.com](mailto:angelo.tempone@duke-energy.com)  
**PLEASE HAVE THIS IN WITHIN 1 WEEK – USE THE MINUTES TEMPLATE FORMAT PROVIDED ON p. 8 OF THIS AGENDA** – confirm WG information is all correct and do not use special formatting or extra indents.
- n. Email any changes to the Meeting Room Request (MRR) form for the upcoming meeting to Angelo Tempone at [angelo.tempone@duke-energy.com](mailto:angelo.tempone@duke-energy.com), such as scheduling conflicts to avoid, e.g. “do not conflict with I50, D87, ...” etc.  
**PLEASE SEND ANY UPDATES BY THE END OF THE MONTH. Last minute cancelations are not helpful; they can significantly affect the agenda, meeting room assignments, and attendees!**

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- o. Thank you for sending WG/TF Rosters with voting and non-voting members listed and marked. The PSRC membership roster has been updated accordingly for the new year: <https://www.pes-psrc.org/src/directory.pdf>.
10. Working Group Reports – 1 minute each, MAX for non-ongoing groups.  
What is your status? Are you on track? Do you need help?

<b>WG/TF #</b>	<b>Name</b>	<b>Officers</b>
I2 (Ongoing)	Terminology Review	Mal Swanson Claire Patti
I4 (Ongoing)	International Standards Development	Eric Udren Normann Fischer
I32	A Survey of Protective System Test Practices	Andre Uribe Will Knapek <i>(no meeting)</i>
I33	Review of Relay Testing Terms	Scott Cooper Hugo Monterrubio <i>(no meeting)</i>
I36	PC37.90.2 - Standard for Relays, Relay Systems, and Control Devices used for Protection and Control of Electric Power Apparatus – Radiated Electromagnetic Interference Withstand Capability Requirements and Tests – Revision of C37.90.2-2004	Chase Lockhart Mat Garver <i>(no meeting)</i>
I37	PC37.90 - Standard for Relays, Relay Systems, and Control Devices used for Protection and Control of Electric Power Apparatus – General Requirements and Tests – Revision of C37.90-2005	Marilyn Ramirez Bill Morse April Underwood
I40	PC37.90.1 - Standard for Relays, Relay Systems, and Control Devices used for Protection and Control of Electric Power Apparatus – Surge Withstand Capability (SWC) and Electrical Fast Transient (EFT) Requirements and Tests – Revision of IEEE C37.90.1-2012	Roger Whittaker Todd Martin <i>(no meeting)</i>
I43	Investigate response to USA executive order regarding EMP protection	Angelo Tempone Dolly Villasmil Johnny Moore
I44	Investigate and write a report on skill sets required by relay test technicians for setting, commissioning, and testing relay systems, given new technologies such as IEC 61850	Andre Uribe Will Knapek <i>(no meeting)</i>
I45	Investigation of Grounding and Bonding Issues Associated with Substation Wiring Practices and Instrumentation	Adrian Zvarych Jalal Gohari
I46	Review and revise: IEEE C57.13.3-2014 – IEEE Guide for Grounding of Instrument Transformer Secondary Circuits and Cases	Bruce Magruder Sudarshan Byreddy

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I47/S18	Review and revise: IEEE C37.231-2006 – IEEE Recommended Practice for Microprocessor-Based Protection Equipment Firmware Control	Milton Quinteros Éric Thibodeau Nicholas Kraemer Charles Pestell
I48	Review and revise: C37.103-2015 – IEEE Guide for Differential and Polarizing Relay Circuit Testing	Mohit Sharma Gary Kobet
P21/I49	Roadmap for developing new or updating existing IEEE standards to address issues of Centralized Protection and Control (CPC) Systems	Craig Preuss Brian Mugalian
I50	Develop a summary paper for IEEE Std C37.92 Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources	Eric Udren Peiman Dadkhah
I51	Develop a summary paper for IEEE Std C37.110 Guide for the Application of Current Transformers for Protective Relaying Purposes	Juan Gers
ITF52	PAR Study Group to determine need for a corrigendum for IEEE Std C37.92-2023 and draft a PAR if there is a need	Eric Udren Charles Pestell

## IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

### IN-PERSON MEETING – Buffalo, NY

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#### I2: Terminology Review

**Chair:** Mal Swanson

**Vice Chair/Secretary:** Claire Patti

**Output:** Terminology recommendations to working groups

**Established Date:** circa 1995

**Expected Completion Date:** on-going

**Draft:** N/A

**Assignment:** Review drafts of PSRC publications for proper terminology, abbreviations, and symbols; and to recommend additions and changes to the PSRC Terminology database as appropriate

The hybrid meeting was called to order by Mal Swanson, at 10:45 am (EDT) on May 15, 2024, with Claire Patti, Vice Chair recording minutes with 6 members and 1 guest in attendance. Quorum was achieved.

The minutes from the January 2024 meeting were reviewed with no corrections provided, Kevin Donahoe motioned for approval and was seconded by Alla Deronja with unanimous approval. Kevin Donahoe motioned for approval of the agenda, seconded by Alla Deronja with unanimous approval.

Roger Whittaker and Fred Friend became non-voting members as they do not plan to attend in-person going forward.

Updates were given on each of the assignments.

The working group reviewed definitions for mho unit and switch onto fault protection.

We are still looking for volunteers to liaise with the following working groups:  
C37.246: Guide for Protection Systems of Transmission-to-Generation Interconnections

All working groups are reminded the database is available to them for use during their document development. All IEEE members have access to The IEEE Standards Dictionary Online using their IEEE account credentials at <https://ieeexplore.ieee.org/browse/standards/dictionary>

Any standards work with a PAR must be submitted for terminology review and approval of terms prior to balloting. The output from a working group in the form of a report does not need a mandatory review; however, these will be accepted for review and comment upon request to the chair.

Words from approved Standards and Guides with a Section 3 (Definitions) have been incorporated into the IEEE database. An alphabetical listing of the words not in the

**IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda****IN-PERSON MEETING – Buffalo, NY****Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

database, but useful to the PSRC is posted on the web site under “TERMS” link under the “Knowledge Base” tab.

The meeting was adjourned at 11:54 am (EDT)

**W.G. I2: TERMINOLOGY USAGE****May 15, 2024****Buffalo, NY**

<b>NAME</b>	<b>Affiliation</b>	<b>Member</b>	<b>Guest</b>
<b>Mal J. Swanson Chairman</b>	Iniven	<b>X</b>	
<b>Claire Patti Vice Chairman/Secretary</b>	Portland General Electric	<b>X</b>	
<b>Matt Black</b>	Sargent & Lundy	<b>X</b>	
<b>Alla Deronja</b>	ATC	<b>X</b>	
<b>Kevin Donahoe</b>	GE Vernova	<b>X</b>	
<b>Addis Kifle</b>			
<b>Colleen Konsavage</b>			
<b>Yuan Liao</b>			
<b>Masihuddin Mohammed</b>			
<b>Manish Patel</b>			
<b>Benton Vandiver</b>	Hitachi	<b>X</b>	
<b>Fred Friend (non-voting)</b>			
<b>Roger Whittaker (non-voting)</b>			
<b>Don Ware</b>	Qualus		<b>X</b>

**I2AttList****Revised May 15, 2024**



## IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

### IN-PERSON MEETING – Buffalo, NY

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#### I4: International Standards Development Working Group

**Chair:** Eric A. Udren

**Vice Chair:** Normann Fischer

**Output:** IEC TC 95 USNC standards votes and PSRC status reports

**Established Date:** 1990

**Expected Completion Date:** Meetings are continuing.

**Assignment:** Develop comments and votes for USNC of IEC on TC 95 (Measuring Relays and Protection Systems) standards projects and drafts. Report to PSRC on IEC Standards development.

Chair Eric Udren called the meeting to order at 2:20 PM EST on Tuesday, May 14, 2024 with three members in attendance.

The minutes of the January 2004 meeting had been circulated twice and no updates are reported.

Dr. Murty Yalla has retired as Chair of TC 95 internationally after the February 22, 2024 TC 95 Plenary Meeting in Largo, FL. The new Chair is Andrea Bonetti of Sweden, a long-time WG and MT contributor.

The Plenary Meeting was attended by 4 US delegates with USNC TA Eric Udren as head of delegation. Meeting minutes and decisions were circulated by the Chair and are available on request. Key standard project outcomes are noted below.

The Project Team 216-3 on *Digital Interface - Test specification for protection data communication of Line Current Differential Protection* also met on February 20-21.

Standards project business:

- **95/547/RQ** – *New TC 95 Chair* – Dr. Murty Yalla retires from Chair of TC 95 in February 2024 after a vigorous and successful 9 year term. Andrea Bonetti (based in SE) is new Chair. Murty will remain with MT4 for coordination and transition.
- Other Plenary documents – **95/545/DA** draft agenda; **95/550/INF** stability or revision dates of standards; **95/551/INF** outgoing liaisons including IEEE PSRC; **95/552/INF** reappointment of Convenors of WGs and MTs. Plenary presentations are available.
- 95/573/DC - TC 95 was requested by ACEA (Advisory Committee on Environmental Aspects) to review and comment the draft of Guide 109 Ed.4 (Environmental aspects – Inclusion in electrotechnical product standards). These were discussed by the attendees, who see these environmental issues as not relevant for a protection system in a fixed installation. They relate to manufacturers and their processes; tracking is complex and well covered by existing environmental standards. Chips cannot be made by forced labor – to be validated before the relay is offered or installed. The function of the relay does not impact these environmental issues. Critical fixed infrastructure should not be subject to these standards. The US summarized the specific and technical reasons why these requirements do not belong in relay standards in its response to IEC after the meeting.

Meeting Participants: Eric Udren, Chair; Bill Morse, SEL; Benton Vandiver, Hitachi ABB

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For the next meeting, we need a room for 15 persons with a projector.

**I37: C37.90, Standard for Relays, Relay System Associated with Electric Power Apparatus****Chair: Marilyn Ramirez****Vice-Chair: Bill Morse****Output: Standard****Established Date: 2018****Expected Completion Date: 2024****Draft: 2.0****Assignment:** Revision of C37.90 Standard. PAR Expiration 31-Dec-2024**Meeting Participants:**

<u>Name</u>	<u>Affiliation</u>	<u>Voting Status</u>
Bill Morse	SEL	Voting Member
Marilyn Ramirez	POWER Engineers	Voting Member
Todd Martin	Basler Electric	Voting Member
Adrian Zvarych	Qualus	Guest
Hani Al-Yousef	Eaton Corp.	Voting Member
April Underwood	SCS	Voting Member
Malia Zaman	IEEE SA	Guest
Daniel Khoroshansky	Entrust	Guest
Tony Bell	Ametek	Voting Member
Suresh Channaranabbc	Westinghouse Electric	Guest

**IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda****IN-PERSON MEETING – Buffalo, NY****Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

- Officer presiding: Marilyn Ramirez
- Officer recording minutes: April Underwood
- Call to order, approximately 1:00 pm
- General welcome
- The meeting had 6 voting members. Quorum was met.
- Patent slides were shown, no claims were made. Copyright and Participant behavior slides were shown, no claims were made.
- Agenda and January 2024 meeting minutes were approved.
  - Motion by Hani Al-Yousef Tony Bell second.
- Discussions:
  - Ballot Process
  - MyProject process.
    - Invite to initiate the balloting of the document was approved. Enrollment as a member of the ballot group is open until June 13, 2024.
    - The draft review process continued.
- Action Items:
  - Monthly meetings to keep the ballot process moving forward.
- Final adjournment, approximately 2:10 pm ET.

**I43: Investigate Response to USA Executive Order Regarding EMP Protection****Chair:** Angelo Tempone (Presiding)**Vice Chair:** Dolly Villasmil**Secretary:** Johnny Moore**Output:** Report**Established Date:** May 11, 2020**Expected Completion Date:** 2024**Draft:** None yet

**Assignment:** Write a report to, (1) Investigate and describe EMPs and their likely effects on protection and control apparatus, and (2) Determine and describe strategies generation, transmission, and distribution utilities can utilize to mitigate the effects of EMPs on their equipment.

The meeting was called to order at 17:00 ET on Monday May 13<sup>th</sup>, 2024 in a Hybrid format.

a) Introductions

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- b) The chair, vice-chair, and secretary introduced themselves. The meeting opened with 9 members and 19 in-person/virtual guests. (28 in person / 1 virtual)
- c) Quorum verification: A quorum was not obtained at the meeting, since less than 11 members were present. The September and January meeting minutes could not be approved without a quorum. However, we will try to approve them electronically later.
- d) Several discussions took place.
- Requested if there is additional expertise in the subject to be able to add additional content in the report if needed.
  - Goal is to complete literature review assignments by August 15th and allow Johnny sufficient time to compile the contributions and be ready for Scottsdale meeting in September 2024.
  - The new format of the report will be of a list of references or literature review rather than a step by step providing guidance given the lack of expertise in the field; however, the request is focused on availability to review content rather than creating new content.
  - Question on how to resolve conflicting views on mitigation recommendations on a particular topic was discussed. It was decided that since we do not have the resources to disprove any of the recommendations, we will provide both or multiple options and allow the end user to determine which option best fits their needs.
  - We are hoping to be completed with the report by 2025 and will request extension at the I-Subcommittee in September based on progress.
- e) Johnny will email the group to gauge interest in providing additional content.

The meeting was adjourned at 17:45 ET.

Our next meeting will be in Scottsdale, AZ in September of 2024 (time TBD). A room for 20 people will be needed.

<b>Name</b>	<b>Last name</b>	<b>Affiliation</b>	<b>Voting Status</b>
Angelo	Tempone	Duke Energy	VM
Dolly	Villasmil	NEI Power Eng	VM
Jim	Michaelis	Commonwealth	G
Jorge	Cintro Rivera	US NRC	G
Muhammad	Hamid	Black & Veatch	G
Sudarshan	Byreddy	Burns & McDonnell	VM
Kevin	Donahoe	GE Vernova	G
Mark	McChesney	ONCOR	G
Greg	Hataway	Burns & McDonnell	G

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Benton	Vandiver	Hitachi Energy	G
Jose	Ruiz	Doble Engineering	G
Alexandre	Piatniczka	Schneider Electric	G
Jeysson	Gonzalez	S&C Electric	G
Hani	Al-Yousef	Eaton Corp	G
Bill	Morse	SEL	VM
Yohann	Beaulieu	Hydro-Quebec	G
Christopher	Ness	Megger	G
Jun	Verzosa	Doble Engineering	G
Galina	Antonova	Hitachi Energy	G
Paul	Harris	Pacificorp	G
Juan	Piñeros	XM Colombia Power System Operator	G
Deepak	Maracal	LND TS	G
Adrian	Zvarych	Qualus	G
Steven	Blair	Synaptec	G
Don	Ware	Qualus	VM
Mike	Basler	Basler Electric	VM
Mark	Adamiak	Adamiak Consulting	VM
Tapan	Manna	Burns & McDonnell	VM
Johnny	Moore	SEL	VM

**I45: Report on Grounding of Instrumentation and Control Circuits****Chair: Adrian Zvarych (Presiding)****Vice Chair/Secretary: Jalal Gohari****Output: Report****Established Date: May 2020****Expected Completion Date: 2024****Draft: None yet – coming soon!**

**Assignment:** The purpose of the WG is to develop a Technical Report reviewing grounding and bonding of circuits associated with instrumentation, protective relaying, communications, power supplies, and other electric facilities in substations. The report will review existing practices and standards, identify where conflicts or omissions exist, and address means of reconciling conflicts.

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Call to order at 09:27 ET, Wednesday 15 May 2024 via Teams, upon reaching Quorum

- a) Introductions, Greetings, & review of Copyright, Patent, and “Be Nice” presentations agreed to
  - a. IEEE Patent Policy: Call for Patents: <https://development.standards.ieee.org/myproject/Public/mytools/mob/slide-set.pdf>
  - b. IEEE Copyright Policy: <https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/copyright-policy-WG-meetings.potx>
  - c. Show Respect For Others
- b) The meeting opened with
  - a. Online (Teams) 4 Members 1 Guests
  - b. In person 4 Members 1 Guests
- c) Quorum verification: Achieved with 8 Members present! Total of 9 Members & 2 Guests @ meetings’ end
- d) Topics Discussed (Action Items in this color):
  - a. Meeting Proposed Agenda Approved
  - b. Past Meeting Minutes Approved Bill – 1<sup>st</sup>, Jim – 2<sup>nd</sup>, passed
  - c. Current Meeting Agenda Approved
    - i. Review Action Items from last meeting:
      1. Z to contact Sakis for “Section 9” content (complete)
      2. Bill to share grounding between two isolated ground systems within a substation. Presentation for 4/24 meeting 😊 (completed today)
      3. Bill/z to work on “bend radius” section (essentially completed)
      4. Mike C – Telcordia references (need to insert into the Report)
      5. Z-clean up Report (admin stuff) (completed)
    - ii. Bill Morse presented a few slides on current flows between isolated systems/”products”. Presentation attached to the email with these Minutes...
    - iii. Report Review, Balloting, and Approval Processing (as understood by your Chair)
      1. Internal WG Report Status Review (non-PAR, so the process is ‘lighter’)
        - a. Chair will review PES-sanctioned Report Checklist (attached to the email and found at the following link) to confirm the formatting conforms to IEEE expectations. [https://ieeepes.org/wp-content/uploads/2023/10/Submission\\_Checklist\\_PES\\_Resource\\_Center\\_Oct2023.docx](https://ieeepes.org/wp-content/uploads/2023/10/Submission_Checklist_PES_Resource_Center_Oct2023.docx)
        - b. Mike C to attempt conversion of black background images in pdf. If not successful, Marilyn Ramirez (Guest) volunteered to redraw images in Visio for insertion (thank you!).
        - c. Z to insert 607B diagrams in the connectivity section
        - d. Z to insert comments on building shielding with respect to HEMP per conversation with Angelo Tempone of the HEMP WG.
        - e. Chair will send out via email the Report to our Voting Members for individual review and Balloting. Responses will be due by our next meeting on 6/5/2024.

**IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda****IN-PERSON MEETING – Buffalo, NY****Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

- i. Approved – No Comments
  - ii. Approved With Comments
  - iii. Not Approved With Comments
- f. Responses from our Voting Members will be due on or before our next scheduled meeting on Wednesday 5 June 2024.
- g. Chair, Vice-Chair/Secretary will review and compile comments and present to the group at the following meeting (scheduled for 6/26/2024) future meetings to resolve any remaining issues, concerns, and corrections.
- h. Once the WG is satisfied with the Report with no further comments, Chair forwards the Report to the PSRC Subcommittee Chair (Ritwick Chowdhury) for submission to the PSRC for the next level of review and balloting. During this period of PSRC review, your Chair anticipates no further WG meetings until PSRC comments, corrections, and suggestions are reviewed. 30 day review period is standard.
- i. Your WG Chair and Vice Chair will compile PSRC comments and present to a future to-be-scheduled meeting for transparency. Updates to the Report to be discussed at that time.
- j. Once Comments are reviewed and incorporated as appropriate, your Chair send the Report back to the Subcommittee Chair, who after a cursory review, will push the document up for publication.
- k. We will then have our ‘final’ celebratory meeting at the next available PSRC on-site meeting...
- iv. Jim Michaelis motioned to send updated Report subject to completion of items b-d above to the WG Members for individual balloting. Don Ware 2<sup>nd</sup>. No discussion or objections.
- v. Welcome Marilyn Ramirez to our WG!!!
- d. Next Meeting – 6/26/2024 12:30 ET via Teams

**Meeting adjournment at 10:30 AM ET by time.****ATTENDANCE LIST**

<b>Jalal Gohari</b>	<b>Jim Michaelis</b>	<b>Marilyn Ramirez</b>	<b>Chance Baker</b>
<b>Bill Morse</b>	<b>Jackie Wilson</b>	<b>Mike Cunningham</b>	<b>Robert Frye</b>
<b>Don Ware</b>	<b>Josh Warner</b>	<b>Adrian Zvarych</b>	

**IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda****IN-PERSON MEETING – Buffalo, NY****Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time****I46: Guide for Grounding of Instrument Transformer Secondary Circuits and Cases****Chair:** Bruce Magruder (Chair)**Vice Chair:** Sudarshan Byreddy**Virtual Meeting/Teams:** 2024, 9:20 – 10:30 AM EDT**Output:** Revise IEEE C57.13.3-2014**Established Date:** September 2021**Expected Completion Date:** December 2026**Draft:**

- a) Call to order – Bruce, 9:20 AM CST
- b) Chair’s greeting & remarks, a total of 8 participants joined in person.
- c) Agenda was presented and reviewed.
- d) Patent slides were reviewed. The attendees did not present any patents requiring further action.
- e) Copyright slides were presented. No comments from the attendees.
- f) As quorum was achieved and Jim O’Brien made a motion to approve the January meeting minutes and Brian Mugalian seconded.
- g) New section 5.7.3.1 on Aux transformer grounding reviewed and approved.

Brian Mugalian made a Motion to approve the draft and submit to I-sub committee to Ballot and Jim O’ Brien seconded.

<b><u>Name</u></b>	<b><u>Affiliation</u></b>	<b><u>Voting Status</u></b>
Bruce Magruder	ECI Consultants	Chair – Voting Member
Sudarshan	Burns & McDonnell	Vice Chair - Voting Member
Jeysson Gonzalez	S&C Electric	Guest
Malia Zaman	IEEEESA	Guest
Brian Mugalian	S&C Electric	Voting Member
Jim O’ Brien	Duke Energy	Voting Member
Randy Roberts	Southern Company	Guest
Daniel Whoroshansky	Entrust	Guest



## IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

### IN-PERSON MEETING – Buffalo, NY

**Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

#### **I47: Revise IEEE C37.231-2006 - IEEE Recommended Practice for Microprocessor-Based Protection Equipment Firmware Control.**

**Chairs:** Milton Quinteros & Eric Thibodeau

**Vice Chair:** Nicholas Kraemer

**Output:** Standard

**Established Date:** January 2024

**Expected Completion Date:** December 2027

**Draft:** NA

**Assignment:** Prepare a revision of C37.231

This was the second meeting for joint WG I47/S18. The chair called the meeting to order. The meeting was presided over by Eric Thibodeau and minutes were recorded by Charles Pestell. The attendees introduced themselves to the meeting. Dan Ransom (online attendee) was not able to speak at his time. The chair invited interested parties to become members of the group.

Quorum was established. There were 5 members in the room and 2 online. A total of 7 members were present with 6 needed to establish Quorum. There was a total of 20 people in attendance

The IEEE SA patent claim and copyright slides were presented with no comments from the meeting.

The IEEE participant behavior slides were presented with no comments from the meeting.

Nicholas Kraemer proposed that the agenda be updated to include review and approval of previous minutes. Gayle Nelms seconded the motion and it was passed with unanimous consent.

James Formea motioned that the agenda be approved, Hani Al-Yousef seconded the motion and it passed with unanimous consent.

The minutes (version draft 0.4) from our January 2024 meeting (New Orleans) were presented and reviewed. James Formea motioned that they be approved, Nicholas Kraemer seconded the motion. The motion was passed by unanimous consent.

The PAR approved in 2016 was presented and reviewed.

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The existing work slide was displayed and reviewed, no changes were requested and no questions were raised regarding this information.

The proposed revised table of contents was reviewed in conjunction with Annex A and Annex B outlines. The floor was opened for discussion. A question was asked asking where these materials had been acquired, the Chair explained that it was a hybrid of the existing standard and the officers' thoughts regarding the standard's future direction. Further clarification was given highlighting the items that were derived from the current version of the standard.

There was discussion of the inclusion of references to hardware versions, this was clarified as currently discussed in section 3.16 of the present standard.

There was discussion of the future standard prescribing a format for firmware version numbering, it was stated by the secretary that this is the purview of the manufacturer. Section 3.2 of the present standard was displayed to clarify the existing content.

There followed a discussion regarding what level / type / severity of firmware issues should be disclosed within the release documentation and the level of detail that should be required from manufacturers releasing new firmware. The headlines from the a lengthy discussion of this point are :

- Vendors should not be burdened by the standard with exhaustive testing of all bugs in all prior versions.
- Device users will expect guidance from the vendor as to whether an update of pre-existing units is required and if so why.
- Should steps and conditions required to reproduce bugs be included in the release information.

Following this discussion it was proposed that the release document shall describe the issue(s) addressed in the firmware version, which prior versions the issue is to be found in and how the issue can be reproduced. An informal show of hands from the meeting to gauge support for this proposal was requested, this was inconclusive.

The question of whether virtual devices are included within the scope of this standard was raised, time did not permit discussion of this.

It was agreed that the matter of offline meetings (meetings between the main committee meetings) will be discussed by the officers at their next regular meeting.

It was requested that the next meeting include a discussion of the work by the S17 Task force ("Report on use of SBOM in the Energy sector group").

**IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda****IN-PERSON MEETING – Buffalo, NY****Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

The meeting was adjourned at 1150EST as the allotted time had elapsed.

Next meeting will be on September 9-12, 2024 held at Embassy Suites by Hilton Scottsdale Resort, AZ.

**Meeting Participants:**

<b>First Name</b>	<b>Last Name</b>	<b>Affiliation</b>	<b>Role*</b>
<b>Eric</b>	<b>Thibodeau</b>	<b>Hydro Quebec</b>	<b>Chair</b>
<b>Nicholas</b>	<b>Kraemer</b>	<b>NuGrid Power</b>	<b>Vice</b>
<b>Charles</b>	<b>Pestell</b>	<b>Powell</b>	<b>Sec</b>
<b>Hani</b>	<b>Al-Yousef</b>	<b>Eaton</b>	<b>M</b>
<b>James</b>	<b>Formea</b>	<b>Eaton</b>	<b>M</b>
<b>Gayle</b>	<b>Nelms</b>	<b>SEL</b>	<b>M</b>
<b>Nathan</b>	<b>Wallace</b>	<b>Cybirical</b>	<b>M</b>
<b>Steven</b>	<b>Blair</b>	<b>Synaptec</b>	<b>G</b>
<b>James</b>	<b>Bougie</b>	<b>Albirco energy</b>	<b>G</b>
<b>Markus</b>	<b>Epting</b>	<b>S&amp;C Electric</b>	<b>G</b>
<b>Timothy</b>	<b>Erwin</b>	<b>GE Vernova</b>	<b>G</b>
<b>Mario</b>	<b>Jardim</b>	<b>Schneider Electric</b>	<b>G</b>
<b>Anthony</b>	<b>Johnson</b>	<b>SCE</b>	<b>G</b>
<b>Addis</b>	<b>Kifle</b>	<b>Georgia Transmission Corp</b>	<b>G</b>
<b>Jim</b>	<b>Michaelis</b>	<b>Commonwealth Association</b>	<b>G</b>
<b>Scott</b>	<b>Mix</b>	<b>PNNL</b>	<b>G</b>
<b>Alexandre</b>	<b>Piatnicska</b>	<b>Schneider Electric</b>	<b>G</b>
<b>Dan</b>	<b>Ransom</b>		<b>G</b>
<b>Jose</b>	<b>Ruiz</b>	<b>Doble Engineering</b>	<b>G</b>

\*M = Voting Member, NVM = Non-voting Member, G = Non-member/Guest.

## IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

### IN-PERSON MEETING – Buffalo, NY

Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time

#### I48: Revision to IEEE C37.103: Guide for Differential and Polarizing Relay Circuit Testing and Polarizing Relay Circuit Testing

**Chair:** Mohit Sharma

**Vice Chair:** Gary Kobet

**Secretary:** Open

**Output:** IEEE Standard

**Established Date:** January 2023

**Expected Completion Date:** December 2025

**Assignment:** Revise IEEE Std C37.103 - Guide for Differential and Polarizing Relay Circuit Testing

I-48 met in-person on May 14th, 2024, at 1 PM CST with 3 members and 3 guests. Quorum was not met so agenda and previous meeting minutes couldn't be approved. These minutes will need to be approved via email to the working group members.

Patent and copyright policies were reviewed and there was no potential claim.

Comments from Section 14 were reviewed with the following disposition:

- The WG agreed that Figure 34 erroneously attempts to illustrate a differentially connected overcurrent along with a restricted earth fault element with an operate coil and a directional coil. Swagata D will provide a revised figure (using Visio) to (1) remove the auxiliary CT, (2) remove the summation connection of the neutral CT with the residual of the phase CTs, (3) show a microprocessor relay with one input connected to the residual of the phase CTs and a second input connected to the neutral CT.
- The WG agreed that we should clarify what wiring problems can affect the performance of the REF element, e.g., (a) wye-side zone boundary CTs mistakenly connected in delta instead of wye, (b) incorrect CT ratio or tap on wye-side zone boundary CTs, (c) incorrect CT ratio or tap on ground CT, (d) wye-side zone boundary CTs and the ground CT are not connected with differential polarities. It is also possible that the CTs on the primary system are connected with differential polarities, but either the terminal or ground CT secondary wiring is swapped at the relay terminals. Then in each test, we should clarify what all problems that test can detect. For example, the DC primary and secondary test can detect incorrect polarity (problem d) but not problems a, b, and c above. Swagata D will edit the Word document of the Guide with "Track Changes".
- In Subclause 14.2, the WG agreed we need to point out the differences in connection when CTs are accessible and when they are not. For example, in Fig 36, we are shorting the other sides of the

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transformer to reduce the impedance seen by the test source. Swagata D will revised Figure 36 (both a and b) to clarify the bushing locations.

- The WG agreed Subclause 14.2.2 needed revision as follows: (1) For the non-accessible internal CTs, it is not clear why each individual winding inside the delta needs to be shorted; (2) For each case in Figure 36(a) and Figure 36(b) it is not clear to users that the secondary windings need to be shorted/grounded; (3) It may not matter given point 1 above, but the subclause and Figures do not mention buried tertiary windings vs. tertiary windings with terminal connection brought out to bushings; (4) There is an example of how to calculate VA rating of the test source. The WG agreed there should be a general equation where users can plug in their system ratings and be able to calculate the VA rating; (5) Figure 38 shows a connection from the tertiary bus to the neutral bus, which does not affect the circuit at all and should be removed. Swagata D will work with Josh H to revise this subclause to correct/clarify as needed.
- Regarding Subclause 14.3, it was noted that each Clause contains specific guidance on in-service tests on differential protection for each type of primary equipment. Swagata D will review the other subclauses addressing in-service tests to see if anything needs to change in Subclause 14.3.
- The recommendation was made to add this paper to bibliography: S. Das, A. Hargrave, M. Taberer, and M. J. Thompson, “A Call to Action: Say YES to Restricted Earth Fault Protection,” proceedings of the 76th Annual Conference for Protective Relay Engineers, College Station, TX, March 2023

Comments from Section 8.3 were reviewed as follows:

- The WG accepted Zachary Z’s comment to add the phrase “the operate current is expected to be” in the third paragraph of this subclause.
- Zachary Z made this comment in the sixth paragraph of this subclause: “This method should be done with a minimum of two CT contributions in case the one used and removed is one that has a short.” After some discussion, the WG believes we should state this should be done with each CT contribution, but should first check for zero differential current before removing any contribution.

Comments from Section 9 will be reviewed at the next meeting.

Ryan M has reviewed Appendix A, and he feels everything is good. He recommends adding a reference in the appendix that is directly related: M. Thompson, J. Hostetler, A. Hargrave, S. Sawai, “Stop the Epidemic! Transformer Protection Mis-operations”, proceedings of the 75th Annual Conference for Protective Relay Engineers, College Station, TX, March 2022.

#### Action Items:

- Mohit S to start updating images.
- Mohit S to check with I subcommittee about the possibility of a survey in identifying linear couplers presence for bus protection. Plan is to remove the description and drawing on linear coupler if it is non-existent in the field these days. Gary K notes that C37.234-2021 Guide for Protective Relay Applications to Power System Buses has extensive information regarding linear couplers, e.g., Subclauses 6.1.2, 7.2.1, and

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in subclause 7.2.6 the Guide states: “This guide does not consider linear coupler applications in detail. A number of schemes using linear couplers have been deployed in the past, remain operational, and are being refurbished as required, but practically no new installations are being added.” Until linear couplers are removed from C37.234, Gary K suggests we retain the information on linear couplers in C37.103.

- Regarding the use of “shall”, “should”, and “may”, Gary K notes that a Guide can only use the term “may”. Of the three IEEE PAR products (Guide, Recommended Practice, Standard), the term “should” can be used in a Recommended Practice, and the term “shall” can be used in a Standard. But “should” and “shall” are not permitted in Guides such as C37.103.
- **Outstanding Review work -**
  - Review Section 4 & 5 and suggest improvements – Jim Niemira, Joshua Hughes
  - Review Section 10 & 11 and suggest improvements – Angelo Tempone, Ryan McDaniel
  - Review Section 12 & 13 and suggest improvements – Mohit Sharma, Ryan McDaniel

The latest working copy of the document is:

“C37.103\_Draft1.0\_LatestTemplate\_ZZ Comments\_May14\_meeting.doc”.

This document has been uploaded to IEEE Central Desktop in the working area for I48 under “Standards Development\Draft Standards\Draft DX”. WG members should make sure they have access to this site.

#### **Attendance List:**

Gary Kobet – Vice Chair, TVA, Voting Member  
Joshua Hughes – Member, Qualus, Voting Member  
Swagata Das – Member, SEL, Voting Member

**Old Business:** None

The meeting was adjourned at 2:10 PM EDT.

## **IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda**

### **IN-PERSON MEETING – Buffalo, NY**

**Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

#### **I49: Roadmap for Developing New or Updating Existing IEEE Standards to Address Issues of Centralized Protection and Control (CPC) Systems**

**Chair:** Craig Preuss

**Co-chair:** Brian Mugalian

**Secretary:** Melvin Moncey Joseph

**IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda**

**IN-PERSON MEETING – Buffalo, NY**  
**Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

## PSCCC P21 – PSRC I49 Joint Task Force[Working/Study Group, Task Force] Meeting Minutes

Designation: P21	Name: Roadmap for Developing New or Updating Existing IEEE Standards to Address Issues of Centralized Protection and Control (CPC) Systems				
Meeting Location: Buffalo, NY	Meeting Time: 3:40 PM	Meeting Date: 2024/05/13	Minutes Revised:	Minutes Approved:	
Presiding Officer: Brian Mugalian and Mike Dood, Co-Chairs		Recorded by: Melvin Moncey Joseph	Draft Number: 0.11		
Attendance:					
Name		Affiliation		Attending via Phone	M/C
Andre Melo		Schneider Electric		L	M
Anthony Johnson		SCE		L	M
Austin Wade		SEL		L	M
Brian Mugalian		S&C Electric Co		W	M
Charles Pestell		Powell Industries		L	M
Chris Huntley		SEL		L	G
Daniel Sabin		Schneider Electric		L	M
David Dolezilek		SEL		L	M
David Williams		FirstEnergy		W	
Deepak Maragal		LND TS		L	M
Don Ware		Qualus Power Services		L	M
Eric Thibodeau		Hydro Québec		L	M
Gayle Nelms		SEL		L	M
Hani Al-Yousef		Eaton Corporation		L	M
Herb Falk		OTB Consulting		L	M
Jack Jester		Exelon Corporation		L	M
James Bougie		Alberio Energy		L	G
Jay Anderson		SEL		W	M
Jim Michaelis		Commonwealth Associates, Inc.		L	M
Jose Ruiz		Doble		L	G
Juan Pineros		XM S.A. Colombia Power System Operator		L	G
Jun Verzosa		Doble Engineering		L	G
Justin Turner		GE Grid Solutions		L	
Kamal Garg		SEL		L	G
Karen Wyszczelski		SEL		W	G



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Marcos Velazquez Lechuga	Doble Engineering	L	M
Mark McChesney	Oncor Electric Delivery	L	M
Melvin Moncey Joseph	Burns & McDonnell	L	M
Michael Basler	Basler Electric	L	G
Mike Dood	SEL	L	M
Mital Kanabar	GE Grid Solutions	L	G
Muhammad Hamid	Black & Veatch	L	G
Nathan Wallace	Cybirical	W	G
Nicholas Kraemer	NuGrid Power	W	G
Paul Harris	PacifiCorp	L	M
Priya Raghuraman	Siemens Industry Inc	L	G
Priyanka Nadkar	SEL	L	G
Scott Mix	Pacific Northwest National Laboratory	L	G
Steven Blair	Synaptec	L	G
Sudarshan Reddy Byreddy	Burns & McDonnell	L	M
Xiangyu Ding	S&C Electric Co	W	G
Ding Lin	Manitoba Hydro	L	G
Randy Roberts	Southern Company	L	G
Jeysson Gonzalez	S&C Electric Co	L	G
Stephen Miller	Energy Emissions Intelligence	L	G
Daniel Lebeau	Hydro Québec	L	G
Abel Gonzalez	Megger Ltd	L	G
Greg Hataway	Burns & McDonnell	L	G
Dean V. Sorensen	National Grid	L	G
Libin Varghese	NYPA	L	G
Craig Marien	Eversource	L	G
Craig Wester	GE Vernova	L	G
Bailey Barksdale	LCRA	L	G
Yohann Beaulieu	Hydro Québec	L	G
M: Member			
CM: Corresponding Member			
G: Guest			

Item no.	Notes	Action by
<b>CALL TO ORDER</b>	secretary brought the meeting to order at approximately 3:40 PM.	
<b>INTRODUCTIONS AND QUORUM</b>	Quorum was met.	
<b>AGENDA APPROVAL</b>	Don Ware motioned to approve, and it was seconded by Eric Thibodeau. No objections or abstentions.	

**IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda****IN-PERSON MEETING – Buffalo, NY****Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

Item no.	Notes	Action by
<b>APPROVAL OF PREVIOUS MINUTES</b>	Meeting minutes from the March 6 <sup>th</sup> meeting were shown. Don Ware motioned to approve the minutes, and it was seconded by Paul Harris. No objections or abstentions.	Secretary to show the April 3 <sup>rd</sup> meeting minutes during the next official meeting.
<b>P21 / I49 ASSIGNMENT</b>	Roadmap for developing new or updating existing IEEE standards to address issues of Centralized Protection and Control (CPC) Systems	
<b>REVIEW OF COPYRIGHT SLIDES</b>	The task force will follow IEEE-SA copyright policies as best practice since the task force is preparing a report.	
<b>REVIEW OF PARTICIPANT BEHAVIOR SLIDES</b>	The task force will follow IEEE-SA participant behavior as best practice since the task force is preparing a report.	
<b>OLD BUSINESS</b>	None.	
<b>NEW BUSINESS</b>		
	<p>Future Meeting schedule. The extension of the Task Force assignment was brought up. The secretary mentioned to the group that the assignment of the group can be conservatively completed by January 2025. It was decided to extend the work till the January 2025 JTCM meeting. Eric Thibodeau motioned to approve the extension of the Task Force assignment, and it was seconded by Paul Harris. No objections or abstentions.</p> <p>Hani Al-Yousef motioned to approve the new meeting schedule which will be biweekly from the 29<sup>th</sup> of May till the September PSRC/PSCC meeting, and it was seconded by Brian Mugalian. No objections or abstentions. A concern was raised regarding meeting timings clashing with other meetings.</p>	Secretary to send out new meeting invites till the next PSRC/PSCC meetings in September. The concern regarding meeting schedule clashes will be brought up in an officer meeting.
	Poster Session at PES General Meeting. The secretary showed the proposed poster and informed the group about the progress that was made and future plans. There was a question regarding whether proper copyright procedure was used for one of the diagrams in the poster.	Secretary to follow up regarding the copyright.

**IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda****IN-PERSON MEETING – Buffalo, NY****Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

Item no.	Notes	Action by
	Report Draft and Assignments. The draft report was shown. Volunteers were called to write sections of the report which weren't assigned earlier. It was brought up in the meeting that this final draft needs to be checked by IEEE SA since the document is of such importance.	IEEE P2808 – Nathan Wallace and Deepak to work on the section.  IEEE C37.118 and PDC - Mital Kanabar will present on June 12 <sup>th</sup> .
<b>ITEMS REPORTED OUT OF EXECUTIVE SESSION</b>	There was no executive session.	
<b>TIME OF FINAL ADJOURNMENT</b>	Approximately 4:50 PM.	
<b>NEXT FACE TO FACE MEETINGS</b>	September 9 - 12 2024  Scottsdale, AZ	

**I50: Summary paper for IEEE Standard C37.92 Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources****Chair:** Eric Udren**Vice Chair:** Peiman Dadkah**Output:** Summary Paper**Established Date:** January 2024**Expected Completion Date:** December 2025**Draft:** NA**Assignment:** Prepare summary paper for IEEE Std C37.92-2023 Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources.

The chair called the second meeting for WG I50 meeting to order, with meeting minutes recorded by Charles Pestel. The attendees introduced themselves. There was discussion on the low-energy analog (LEA) sensors and interfaces and the importance of this standard and its adoption.

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The chair presented a first outline for the paper, and then supported the content proposals with a review of the overview presentation from September 2003. Prior presentation reviewed.

CP suggested adding some comments about different, non-compliant, implementations of the connections to LEA transducers by protection relays to section 6.

In response to a question from Abel on differences among bandwidths of the different sources, the scope of the standard was reviewed.

There was discussion of testing applications and signal simulation.

How long does the paper have to be? Six to eight pages would be the maximum.

We should discuss the use cases, which have been added as a section in the outline. The attendees made further additions to the table of contents.

CP agreed to write the "Drivers & Use cases" section with Nallan Kumar from SEL

Ritwik will work on Section 6

Paul Harris & Abel Gonzalez (Megger) & Steven Blair will take Section 7

Hani Al Yousef & Ritwik will work on Section 4

Hani AL Yousef and Eric will work on Section 5

Eric will send the updated outline with the minutes.

Charles suggested we use the Standard project iMeet site – to check.

**Meeting Participants:**

<b>First Name</b>	<b>Last Name</b>	<b>Affiliation</b>	<b>Role*</b>
Eric	Udren	Quanta Technology	C
Ritwik	Chowdhury	SEL	M
Charles	Pestell	Powell	M
Hani	Al Yousef	Eaton	M
Abel	Gonzalez	Megger	M
Paul	Harris	Pacificorp	M
Steven	Blair	Synaptec	M
Joshua	Hughes	Qualus	G
Nallan	Kumar	SEL	M

\*M = Voting Member, NVM = Non-voting Member, G = Non-member/Guest, C = Chair, VC = Vice Chair, S = Secretary

## IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

### IN-PERSON MEETING – Buffalo, NY

**Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

#### **I51: Summary paper for IEEE Std C37.110 Guide for the Application of Current Transformers for Protective Relaying Purposes**

**Chair:** Juan Gers

**Vice Chair:** NA

**Output:** Summary paper

**Established Date:** May 2024

**Expected Completion Date:** NA

**Draft:** NA

**Assignment:** Develop a summary paper for IEEE Std C37.110 Guide for the Application of Current Transformers for Protective Relaying Purposes

The kickoff meeting had attendance from the chair. There were no other participants. The chair will work with the I Subcommittee chair and ITF51 chair to get information about potential participants.

#### **ITF52: PAR Study Group to determine need for a corrigendum for IEEE Std C37.92-2023 and draft a PAR if there is a need.**

**Chair:** Eric Udren

**Vice Chair:** NA

**Output:** Recommendation to the SC for or against a PAR

**Established Date:** January 2024

**Expected Completion Date:** December 2024

**Draft:** NA

**Assignment:** Determine need for a corrigendum for IEEE Std C37.92-2023 and draft a PAR if there is a need

This was the first task force meeting. The chair provided a background on IEEE Std C37.92-2023 and the scope of the potential corrigendum.

It was noted that IEC standards also refer to these as HV and LV and that it might be a misstep to move away from the HV and LV terms. There is consistency between IEEE and IEC. However, from a manufacturer's perspective, there can be confusion. Considering that this work is gaining traction right now, the confusion may not be very helpful.

One option that was brought to the discussion was to consider adding a footnote that clarifies the HV and LV usage. The attendees all agreed that this would be the right path forward.

Ritwik Chowdhury made the motion to develop a corrigendum for IEEE Std C37.92-2023 that provides clarifications to the transducer output class definitions. Charles Pestell seconded the motion. The motion passed unanimously.

Meeting Participants:

**IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda****IN-PERSON MEETING – Buffalo, NY****Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

First Name	Last Name	Affiliation	M/NVM/G
Eric	Udren	Quanta Technologies	C
Ritwik	Chowdhury	SEL	M
Charles	Pestell	Powell	M
Todd	Martin	Basler	G
Deepak	Maragal	LND Technical Services	G

\*M = Voting Member, NVM = Non-voting Member, G = Non-member/Guest, C = Chair, VC = Vice Chair, S = Secretary

**11. Old Business**

- a. If you would like to be a liaison, please email Ritwik Chowdhury at [ritwchow@ieee.org](mailto:ritwchow@ieee.org). Still looking for liaison for the following committees:
  - i. Transformers Committee, including Instrument Transformer Subcommittee.
- b. WG I33 “Review of Relay Testing Terms” I-SC Recirculation results (from January 31, 2024):
  - i. 34 out of 39 I-SC members (87%) responded to the ballot.
  - ii. 32 of those 34 were approvals. Two disapprovals carried over from the previous recirculation without any new comments from those members. Two SC members provided approval with new comments.
  - iii. Need at least 75% approval from the subcommittee (i.e., 30 I-SC members).

WG is working on resolving the new comments and the changes—if not minor and editorial—will be sent out for SC recirculation.

- c. WG I44 “Skills Required to Program, Commission, Test, and Maintain Ethernet Based PAC Systems” I-SC Ballot results (from March 1, 2024):
  - i. 35 out of 39 I-SC members (90%) responded to the ballot.
  - ii. 30 of those 35 were approvals and 5 disapprovals. Overall, 11 SC members provided comments.
  - iii. Need at least 75% approval from the subcommittee, which is 30 I-SC members.

WG is working on resolving the new comments and the changes—if not minor and editorial—will be sent out for SC recirculation.

**12. New Business**

- a. MOTION requesting disbandment of WG I26 following publication on November 13, 2023, of IEEE PES TR117 Mathematical Models for Current, Voltage, and Capacitively Coupled Voltage Transformers.

Motion by: Mike Meisinger

Second by: Don Ware

**IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda****IN-PERSON MEETING – Buffalo, NY****Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

- b. MOTION requesting disbandment of WG I31 following publication on February 26, 2024, of IEEE Std 1613-2023 IEEE Standard for Environmental and Testing Requirements for Devices with Communications Functions used with Electric Power Apparatus.

Motion by: Brian MugalianSecond by: Kevin Donahoe

- c. MOTION requesting PAR submittal by ITF52 to develop a corrigendum for IEEE Std C37.92-2023 that provides clarifications to the transducer output class definitions.

Note—If PAR is approved, WG I52 will form with Eric Udren as chair and Charles Pestell as Vice Chair.

Motion by: Eric UdrenSecond by: Jim Niemira

- d. MOTION requesting IEEE-SA Ballot initiation for Working Group I46 using PC57.13.3 IEEE Guide for Grounding of Instrument Transformer Secondary Circuits and Cases Draft 1C.

Motion by: Bruce MagruderSecond by: Don Ware

- e. Discussion on Entity Proposal P0163 for an IEEE Recommended Practice on “Unique IDs and Smart Tags for Supply Chain and Asset Traceability for the Electric Grid.” Options for SC:
- i. Out of SC Scope
  - ii. In scope and SC will sign onto the EPM as a Non-Lead Joint Committee in the role of [pick one] (Liaison, Task Force, Working Group)  
Note—This takes votes at the SC and at the Main Committee. Approval per P&P SA 7.1.1.e) which is a Majority Vote.
  - iii. In scope and the SC will sign onto the EPM as a Lead Joint Committee in the role of [pick one] (Liaison, Task Force, Working Group).  
Note—Currently, the PSRC is not typically signing onto Lead roles of Entity PARs. This will need additional discussion with the PSRC officers prior to going forward as an Entity PAR lead.

Possible MOTION following discussion of Entity Proposal.

Motion by: Jim Niemira (e.ii—Liaison)Second by: Adrian Zvarych

- f. Discussion on Entity Proposal P0166 for an IEEE Guide on “Proactive Mitigating Distribution System Evoked Woodland Wildfire.” Options for SC:
- i. Out of SC Scope
  - ii. In scope and SC will sign onto the EPM as a Non-Lead Joint Committee in the role of [pick one] (Liaison, Task Force, Working Group)  
Note—This takes votes at the SC and at the Main Committee. Approval per P&P SA 7.1.1.e) which is a Majority Vote.

**IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda****IN-PERSON MEETING – Buffalo, NY****Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

- iii. In scope and the SC will sign onto the EPM as a Lead Joint Committee in the role of [pick one] (Liaison, Task Force, Working Group).  
Note—Currently, the PSRC is not typically signing onto Lead roles of Entity PARs. This will need additional discussion with the PSRC officers prior to going forward as an Entity PAR lead.

Possible MOTION following discussion of Entity Proposal.

Motion by: Austin Wade f.i      Second by: Jim Niemira

## 13. Liaison Reports

- a. Power System Instrumentation and Measurements (PSIM) Committee, including the Sensors Subcommittee – Johnny Moore

No activity to report.

PSIM has not met since JTCM in January 2024. The next set of meetings is scheduled during the PES General Meeting (July 21 to 25, 2024, in Seattle, WA).

- b. Entity IEEE Standard P3416 Guide for Test Sets and Tools for Testing Protective Relays – Angelo Tempone

- This working group has met twice since the last I-Subcommittee meeting. Once in February and once in April.
- The entity members are consistently participating in these meetings.
- They are following IEEE guidelines and processes for developing documents similarly to ours.
- They are reviewing contributions by the working group members and working through comments or concerns being addressed by attendees.
- They are planning on meeting again in May, which may include a face-to-face option in addition to the virtual meetings that they are hosting every two months.

Jun Verzosa has agreed to be the standards committee representative (SCR) and the I-Subcommittee liaison for P3416 going forward.

- c. PSRC China Satellite I-SC Liaison, Shenxing Shi?

## 14. Presentation

- a. None.

## 15. Other announcements?

- a. ?



**IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda****IN-PERSON MEETING – Buffalo, NY****Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

16. Motion to Adjourn, by Don Ware, second by Cathy Dalton  
Adjourn time: 4:08 PM

**Next meeting is in-person only** in Scottsdale, AZ, September 2024.

Stay well, and we look forward to seeing you again soon!

**Attendance List for the I Subcommittee Meeting**

<b>Role</b>	<b>First Name</b>	<b>Last Name</b>	<b>Company</b>
Guest	Tony	Bell	Ametek
Guest	Laurel	Brandt	TVA
Guest	Suresh	Channarasappa	Westinghouse Electric
Guest	Stephen	Conrad	Public Service Co of NM - Retired
Guest	Juan	Gers	GERS USA
Guest	Randy	Hamilton	Basler Electric Co
Guest	Andrew	Kunze	Enbridge
Guest	Malia	Zaman	IEEE-SA
Guest	Souvik	Chandra	Eaton
Guest	Mat	Grover	Beckwith
Guest	Daniel	Khoroshansky	Entrust Solutions Group
Guest	Nallan	Kumar	SEL
Guest	Charles	Pestell	Power Industries
Guest	Randy	Roberts	Southern Company
Guest	Dennis	Tierney	Celoine
Guest	April	Underwood	Southern Company
Chair	Ritwik	Chowdhury	SEL
Guest	Sudarshan	Byreddy	Burns & McDonnell
Guest	Michael	Thompson	SEL Engineering Services, Inc.
Guest	Austin	Wade	SEL
Voting Member	Hani	Al-Yousef	Eaton Corporation
Voting Member	Tom	Beckwith	Beckwith Consulting
Voting Member	Catherine	Dalton	EPRI
Voting Member	Kevin	Donahoe	GE VERNOVA

**IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda****IN-PERSON MEETING – Buffalo, NY****Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

Voting Member	Gary	Kobet	Tennessee Valley Authority
Voting Member	Bruce	Mackie	Nashville Electric Service
Voting Member	Bruce A.	Magruder	Electrical Consultants, Inc.
Voting Member	Todd	Martin	Basler Electric
Voting Member	Hugo	Monterrubio	Beckwith Electric
Voting Member	Brian	Mugalian	S&C Electric Company
Voting Member	James	Niemira	S&C Electric Company
Voting Member	Marilyn	Ramirez	Power Engineers
Voting Member	Malcolm	Swanson	M J Swanson Associates
Voting Member	Eric	Udren	Quanta Technology, LLC
Voting Member	Andre	Uribe	Qualus Power Services
Voting Member	Donald	Ware	Qualus
Voting Member	Adrian	Zvarych	Qualus

**IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda****IN-PERSON MEETING – Buffalo, NY****Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time****Reference Material:**

WG and TF Minute Format Template: **Please use the following template to simplify compilation of the Minutes from all the groups! Refer to PSRC P&P for WGs for the minimum information to be included in the Minutes.**

**L##: Title of Working Group****Chair:** ???**Vice Chair:** ???**Secretary:** ???**Output:** ??? (Paper, Report, Tutorial, Guide, Recommended Practice, Standard, etc.)**Established Date:** ??? (Month, Year)**Expected Completion Date:** ??? (Month, Year)**Draft:** ???**Assignment:** ???

The following information should be included in your minutes as appropriate. The working group is free to use whatever form they choose to cover the items from the below list that apply to the meeting.

- h) Officer presiding
- i) Officer recording minutes
- j) Call to order
- k) Chair's remarks
- l) Results of call for quorum
- m) Approval of Agenda (motion and second)
- n) Approval of Minutes of previous meetings (motion and second)
- o) Brief summary of discussions and conclusions including any motions.
- p) Action items
- q) Items reported out of executive session (if such sessions have occurred)
- r) Recesses and time of final adjournment (if different from our published face-to-face meeting agenda)
- s) Next meeting date and location (if different from our published face-to-face meeting schedule)
- t) Attendance list of participants: name, affiliation, and role (voting member, non-voting member, non-member, etc.)
- u) Old business section that includes minutes or notes from any intermediate virtual meetings since the previous PSRC meeting

**Additional notes:**

- a) Be diligent to keep the standard header information up to date.
- b) Expected completion date gives anyone a reasonable idea of where you stand in your work – without having to seek out another document such as the excel spreadsheet listing what rev you are on.
- c) Do not include meeting room requests and conflict avoidance requests in your minutes.
- d) Do not use significant paragraph indents.
- e) Keep multilevel numbered lists to no more than two levels if possible.
- f) If this is PAR related activity, include the SA document number in the Title of the Working Group.

## **IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda**

### **IN-PERSON MEETING – Buffalo, NY**

**Wednesday May 15, 2024, 2:45 PM to 4:10 PM Eastern Time**

### ***Proposal for New TF or WG***

**Date:**

**Definition of the Problem**

**What is happening?**

**What should be happening?**

**Proposal for Task Force**

**Submitted by:**

## **J Subcommittee Meeting Minutes, May, 2024, Buffalo, NY**

J Subcommittee (SC) met Wednesday May 15, 2024 at 1:10 PM EDT with 22 out of 34 members and 5 guests, reaching quorum.

A motion to approve the May 2024 J SC agenda was made by Steve Conrad and seconded by Gene Henneberg. The agenda was approved unanimously.

A motion to approve the January 2024 J SC meeting minutes was made by Doug Weisz and seconded by Hugo Monterrubio. The minutes were approved unanimously.

### **Working Group Reports:**

#### **J15: Investigation of the Criteria for the Transfer of Motor Buses**

**Chair: Wayne Hartmann**

**Secretary / Vice Chair: Doug Weisz**

**Established 2015 (1/15)**

**Output: Report (Draft 13C)**

**Status: 28<sup>th</sup> Meeting (5-14-24))**

#### ***Assignment:***

1. Review, compare and contrast NEMA MG-1, IEEE 666, ANSI C50.41 and C37.96 regarding transfer criteria.
2. Examine published reports and papers on motor bus transfer criteria to compare the conclusions with NEMA MG-1, IEEE 666, ANSI C50.41 and C37.96 regarding fast transfer criteria.
3. Investigate existing open-transition motor bus transfer (MBT) field data from multiple events at the medium voltage level. Examine for current versus Volts/Hz at transfer periods to see if there is a correlation. Examine resultant torque ratio.
4. Examine published reports, papers, NEMA MG-1, IEEE 666, ANSI C50.41 and C37.96 on motor bus fast transfer criteria to reconcile the conclusions with the field-measured results.
5. Study modeling of given motors, with varying loading, undergoing fast, in-phase and residual transfers, with reconnection of the motor to a new source at varying phase angles.
6. Produce a Report for the Subcommittee with the above findings.

#### **WG Report:**

1. The Working Group (WG) met on May 14, 2024, in Buffalo, NY (double session).
2. Attendance: Total 14 (8 members and 6 guests).
3. Quorum was achieved. Bracy Nesbit made a motion to approve the minutes from the prior New Orleans meeting and this motion was seconded by Jason Eruneo; therefore those minutes were approved.
4. Wayne reviewed the WG assignment.
5. Approximately half of the 197 submitted comments have been resolved.
6. The WG then reviewed and resolved 21 of the 80 comments submitted by Jason Eruneo.
7. The resolved comment resulted in either a "leave as is" or a "done" conclusion where "done" involved some revisions.
8. A motion to adjourn was made by Ryan Carlson and it was seconded by Dennis Tierney; therefore the meeting was adjourned.

## J Subcommittee Meeting Minutes, May, 2024, Buffalo, NY

### Next Meeting:

Double session, projector, room for 30 people for in-person meeting. The WG also requests no conflict with all J particularly J16 (C37.101)

Note: Future J-15 Meetings will be In-Person only unless otherwise notified

### Meeting Participants:

First Name	Last Name	Affiliation	Role*
Tom	Beckwith	Beckwith Electric	M
Ryan	Carlson	Burns & McDonnell	M
Jason	Eruneo	Duke Energy	M
Randy	Hamilton	Basler	M
Wayne	Hartmann	GE VERNOVA	C
Bracy	Nesbit	LCRA	M
JC	Theron	GE VERNOVA	M
Dennis	Tierney	Calpine Corp	M
Doug	Weisz	Beckwith Electric	VC
Will	English	Consumers Energy	M
Jorge	Cintron-Rivera	NRC	G
Chip	Christmann	Basler	G
Bailey	Barksdale	LCRA	G
Kumar	Nallan	SEL	G

\*M = Voting Member, NVM = Non-voting Member, G = Non-member/Guest, C = Chair, VC = Vice Chair, S = Secretary

### **J16: Revision of C37.101, Guide for Generator Ground Protection**

**Chair: Ryan Carlson**

**Vice Chair: Doug Weisz**

**Established: 2016**

**Output: Guide**

**Status: 20<sup>th</sup> Meeting (5-14-24)**

**PAR Expiration: Dec 2024**

**Assignment:** Revise C37.101 Guide for Generator Ground Protection

### **WG Report**

The WG met with 23 total participants of which 22 were in-person and 1 attended remotely. 8 of the attendees were guests and 15 were WG members including 2 new members: Joshua Hughes & Fred Agyekum.

## J Subcommittee Meeting Minutes, May, 2024, Buffalo, NY

Quorum was achieved. Bracy made a motion to approve the Jan 2024 meeting minutes. Wayne seconded the motion; therefore the Jan 2024 meeting minutes were approved.

After introductions, Ryan reviewed the patent slides required for IEEE PAR WGs and he mentioned that the PAR ends 12-31-2024 so we will be requesting a PAR extension where the J16 designation may be changed.

Ryan mentioned he will post the latest working draft copy of C37.101 in the "Drafts in Progress" folder on imeetcentral. If any members need access to this workspace, please let us know and we will ensure you get access.

The new, overhauled C37.101 format change and table of contents was briefly reviewed. The scope section was moved to the introduction section and the consensus was not to add to that section. Hasnain started a discussion on if the protection for the different grounding methods can include other than generators i.e. medium voltage systems, etc. Although some of the various schemes may be able to be used for protection of other than generators, the group consensus centered around the fact that this guide is specifically for generator ground fault protection.

The title of this guide, "Guide for Generator Ground Fault Protection", was proposed to be changed to "Guide for Generator Stator Ground Fault Protection" where the attendees agreed that this may be a good distinction as field ground fault protection is not and should not be covered in this guide. In the purpose section, the distinction is made that this guide is meant for synchronous generators, which of course would then seem to exclude induction generator ground fault protection. Although some of the schemes and comments in the guide may be used for either type, it was decided to leave this as is.

There was some discussion on intermittent arcing ground fault protection and if it is covered in this standard where Ryan confirmed that it is.

Next, the group discussed and reviewed some of the comments on the low resistance ground fault protection schemes in section 6 of the guide:

- For clarification, Ryan will go thru the guide and replace all the "neutral overvoltage" mentions with "ground overvoltage" terminology.
- Nader began a discussion on when 59G vs 59N should be used. An ad hoc group may be formed to review the guide for all these mentions and to ensure it is synchronized with the IEEE C37.2 standard which is the IEEE device function number guide.
- Of the approximately 300 comments that have been submitted, some 280 of them have been addressed.
- Ryan mentioned per one of the virtual meetings it was decided that section 5.7 will be removed.
- Ritwik submitted a section on protection of parallel generators.
  - Will had written out some equations for this parallel generator protection schemes.
  - If any WG members would like to volunteer to review this section on parallel generator ground fault protection including the equations, please let the Chair and Vice-Chair know.

## J Subcommittee Meeting Minutes, May, 2024, Buffalo, NY

- The content in section 6.1, which was an overview of the LRG method, was moved to the introduction section.
- Ritwik suggested adding a figure that plots differential protection for ground faults versus to fault current level which has been included in the new revision of C37.102
- There was some discussion on the difference between 87N and REF protection where REF includes an extra directional component and may be more secure from CT saturation issues for certain types of ground faults.
  - Ryan will take the first crack at describing the differences between 87N and REF protection.
- Individual Comment Discussion: Refer to the comment spreadsheet on imeetcentral as well.
  - Comment 210 and 211: remove references.
  - Comment 212: Figure 29 may need to be cleared up as the aux CT may be more commonly needed for E/M relays as modern digital relays will have at least some range of a CTR correction factor to account for the difference in ratios between the phase CTs from which the 3I<sub>o</sub> quantity is derived and the single ground CT from which the measured ground fault current is derived for the 87N and the REF algorithms. Although, depending on the ratio mismatch and the available ratio correction factor range available, the aux CTs could still be required for digital relay applications as well.
  - Comment 214: 87N/REF language
  - Comment 215: aux CT discussion as 87N is more susceptible to CT saturation for 2LG or 3LG ground faults, it is typically more secure for 1LG ground faults.
  - Comment 216: The REF paper that Ritwik authored may be reviewed and referenced.
  - Comment 222: core-balance CTs ground differential protection – wrapping the 3 phase conductors and the neutral conductor is typically used more on smaller gens vs wrapping only the 3 phase conductors with a separate, single neutral CT to feed into the relay and 87N/REF algorithm. Consensus was to leave as is.
  - Comment 223: discussion on lines 12 and 13, the last sentence on the advantage of the scheme to provide protection when disconnected vs connected and if it can be set independently of the residual current seen for an external ground fault.
  - Between the double sessions, Dennis commented on if the broken delta 3V<sub>o</sub> measured quantity should be fused before or after the ballast resistor. Also, he mentioned the 2 second time delay as recommended by NERC may be too long for non-seg bus duct although it may be fine for iso-phase bus.
  - Comment 231: decided to remove the figure 34 scheme C with the NGR and NGR as it is primarily used for HRG applications. This is already in the HRG section.
  - Comment 233: resolved, removed sentence, and modified section 6.2.1.
  - Comment 235: revised section 6.2.2.
  - Comment 236: talk about CT saturation explicitly and removed the reference to capacitance as that again is more for HRG schemes.



## J Subcommittee Meeting Minutes, May, 2024, Buffalo, NY

Motion to adjourn was made by Bracy and seconded by Wayne.

### Meeting Participants:

First Name	Last Name	Affiliation	Role*
Bracy	Nesbit	LCRA	M
Dinq	Lin	Manitoba Hydro	G
Doug	Weisz	Hubbell/Beckwith	VC
Fred	Agyekum	SEL	M
Gary	Kobet	TVA	M
Hasnain	Ashrafi	Sargent & Lundy	M
Jacobus	Theron	GE Vernova	M
Jason	Eruneo	Duke Energy	M
Jorge	Cintron-Rivera	NRC	G
Joshua	Hughes	Qualus	M
Malia	Zaman	IEEE SA	G
Nader	Safari-Shad	UW-Platteville	M
Nallan	Kumar	SEL	G
Ritwik	Chowdhury	SEL	M
Ryan	Carlson	Burns & McDonnell	C
Sakis	Meliopoulos	Georgia Tech	G
Scott	Hayes	PG&E	G
Steve	Conrad	Retired	G
Steven	Mueller	Ameren	M
Sudarshan	Byreddy	Burns & McDonnell	M
Wayne	Hartmann	GE Vernova	M
Will	English	Consumers Energy	M
Zeeky	Bukhala	GE Vernova	M

\*M = Voting Member, NVM = Non-voting Member, G = Non-member/Guest, C = Chair, VC = Vice Chair, S = Secretary

### Next Meeting:

The WG requests a double session for the next meeting. A meeting room for 30 people and a projector will be required for the Sept 2024 meeting. Please schedule the session on Tuesday or Wednesday if possible to maximize attendance, but as we are requesting a double session Monday is required then that is acceptable. If a Monday session is scheduled, please make it the last two sessions of the day on Monday. The WG also requests no conflict with other J meetings, if possible.

### **J17: Revision of C37.102 Guide for AC Generator Protection**

**Chair: Manish Das**

**Vice Chair: Gary Kobet**

## J Subcommittee Meeting Minutes, May, 2024, Buffalo, NY

**Output: IEEE Guide**

**Draft: Clean Draft**

**Established: May 2017**

**Status: IEEE Editorial Review for Publication**

**Expected completion date: -June 2024**

**PAR Expiration: Dec 2024**

**Assignment:** Revise C37.102 Guide for AC Generator Protection

### WG Report

J17 update (provided at J Subcommittee meeting Wed, 5/15/2024):

J17 did not meet in Buffalo. C37.102 is in the final stages of the publication process. Multiple rounds of editorial reviews have been held trying to catch cosmetic and editorial imperfections. The guide is in the Editor's peer review process this week, and is expected to be published in the next week or so.

Congratulations to the WG for all their hard work on this revision and for being recognized with awards at the Buffalo Monday night ceremony. IEEE approved the awards in advance since the guide is very close to publication.

The Chair shared that the key changes in this new guide as well as a detailed redline of the 2006 guide was provided to assist the J30 WG that will be writing the summary paper.

The WG is not requesting a J17 meeting in September.

A motion was made at the Subcommittee meeting to disband J17. A second was obtained.

### **J20: Report on Practices for Generator Synchronizing Systems**

**CHAIR: Jason Eruneo**

**VICE-CHAIR: Ritwik Chowdhury**

**Output: Report (Draft 15.0)**

**Established: January 2019**

**Status: Assignment has been completed**

**Assignment:** This report will discuss all aspects related to implementation of a generator synchronization system. This includes design, settings, testing, commissioning practices, monitoring, and protective schemes for generator synchronizing systems. The report will include a range of common system configurations.

### WG Report

The WG did not meet during this PSRC meeting. The report has been published with the IEEE PSRC Knowledge Base and the IEEE PES Resource Center.

A motion to disband the WG was made by Jason Eruneo and seconded by Gene Henneberg. The motion was approved unanimously.

## **J Subcommittee Meeting Minutes, May, 2024, Buffalo, NY**

### **J21: Motor Protection Tutorial**

**CHAIR: Derrick Haas**

**VICE-CHAIR: JC Theron**

**Output: Tutorial**

**Established: September 2019**

**Status: WG (15<sup>th</sup> meeting May 2024 Buffalo, NY)**

**Assignment – Develop a practical motor protection tutorial based around IEEE C37.96. The intent is to aid the reader to develop effective relay settings.**

### **WG report**

The WG met with 7 members, and quorum was not met. 17 attendees.

The vice chair called the meeting to order and asked for introductions.

Januarys' meeting minutes will be approved via email.

Previously there was a recommendation not to include synchronous motor in this tutorial, however in keeping the tutorial in synch with C37.96, synchronous motor must be included.

The only writing assignment that came in was Motor Thermal Protation by Dale and JC. Discussed motor thermal protection.

Plan of attack and general consensus is that we will proceed with writing and presentation assignments and continue to coordinate with J22 activities for any major changes to the guide.

Assignments (writing and PPT) due:

1,2 – Derrick Haas

4 – JC Theron & Dale Finney

7 – Tom Beckwith

5b – Will English

8 – Shashidhan Sathu

11 – Gary Stoedter

9 – Bracy Nesbit

3 – Bracy Nesbit & Dale Finney

6 – Derrick Haas (including broken bar)

5a – JC Theron

10 – Derrick Haas

12 – Deleted section

Clarification that assignment includes both written document and presentation slides.

## J Subcommittee Meeting Minutes, May, 2024, Buffalo, NY

Synchronous motor data sheets reviewed:

- 1 – 30,000 hp
- 2 – 14,000 hp

Examples to be distributed to J21/J22 WG's for examination and selection

Motion to adjourn (Zeeky, 2<sup>nd</sup> Finney)

Action Items:

- Dale Finney and JC Theron took an action item to review the existing material related to thermal element/model in the guide and determine if we needed to add a dedicated section or not. This section is almost done.
- Derrick Haas took an action item review example Induction Motor in Annex A with Dale Finney, who was assigned to review Annex A for J22.
- Gary K to obtain PSRC template for slides
- Derrick to send out assignments, word document template, power point template
- Derrick and Zeeky to distribute motor data sheets.

### Next meeting:

A single session is requested with room for 30 and a projector. Also request no conflict with J, especially J22. Schedule J21 to immediately follow J22.

### **J22: Revision of C37.96, Guide for AC Motor Protection**

**Chair: Zeeky Bukhala**

**Vice Chair: Jason Buneo**

**Secretary: --**

**Output: Guide**

**Draft: -**

**Established Date: May 2021**

**Status: WG Meeting 15**

**Expected Completion Date: December, 2025**

**PAR Expiration Date: December, 2025**

**Assignment:** To revise and update C37.96, Guide for AC Motor Protection

### **WG Report**

1. Welcome/Introduction
  - a. The Chair kicked off the first session at 8:00am EDT and welcomed members and guests, this was followed by introductions. Second session kicked off at 10:22am EDT with 7 members and 4 guests.
  - b. Quorum check. 9 of 30 members were in attendance. Quorum was not met.

## J Subcommittee Meeting Minutes, May, 2024, Buffalo, NY

2. Approval of Meeting Minutes. Chair will seek approval of January, May, September, November 2023, and January 2024 minutes by email. 2023 minutes are already in circulation for approval. Chair will follow up.
3. Patent Slides.
  - a. Patent Slides were shared.
  - b. Chair provided an opportunity for attendees to identify patent claims or applications which they may be aware of that may be essential for the use of that standard and none was identified.
4. Assignments
  - a. Email question submitted to IEEE-SA website by Kuan Yau Che regarding location of overload NC contacts in Figures 1 and 3. Current figures show contacts in series with transformer grounded side. Working group agreed to move contacts to hot side of the transformer. Chair will communicate decision to Kuan Yau Che.
  - b. 6.4 Motor Bus Transfer – Tom Beckwith.
    - i. Reviewed Redline version of R5.
    - ii. 6.4.4 – Residual Voltage Transfer Method
      1. Tom reworded the sentence, “Transfers below 0.25 pu voltage not considered as this may require a complete shutdown and restart.” He deleted the portion about achieving compliance with the 1.33 V/Hz limit. Discussion ensued between Tom and Dennis Tierney.
      2. Dennis Tierney agreed to write more on this topic, Residual Voltage Transfer Method.
    - iii. 6.4.6 to 6.4.13
      1. Tom copied these sections from another part of the document to help with the flow.
      2. Discussion followed between Tom and Dennis on transfers.
      3. Discussion led to agreement to include some onelines to represent possible configurations.
    - iv. Discussion continued on when to transfer motor load and when you want to block a motor transfer. Very difficult to determine when to block a transfer and why. Guide does not specifically address when to block. Dennis Tierney agreed to draft a section on the subject.
  - c. Session 1 ended and Session 2 began after break.
    - i. 6.4.13 – Industry Guidance Related to Research on Residual Voltage Transfer Results
      1. Discussion on how to summarize this section more briefly. Will English suggested to summarize the portion from the other standard and then point out what may be wrong with the method that has been followed for years. ANSI/NEMA C50.41 was referenced in this section.
      2. Tom will rewrite section to make it briefer. Will keep separately the results as this is good information for the working group members.
    - ii. 6.4.14 – Motor Bus Transfer Initiate – When and How to Initiate and Why

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1. Discussed Tom's Figures starting with figure 1. This numbering will need to be fixed to fit into document.
  2. Discussion on various cases of motor transfer. Group discussed that the number of examples may be too numerous and to show fewer examples and stress on how to think when trying to set up a transfer. Working group felt that examples may also be best suited for the appendix and/or tutorial.
  - iii. 6.4.15 Transient Simulation and Calculation of Transient Current and Torques on Motors During Residual Voltage Motor Bus Transfer. Brief discussion on what Tom included
  - iv. 6.4.18 Motor Bus Transfer Relay System Performance Testing.
    1. After some discussion it was agreed that this section was out of scope of the Guide and was recommended for inclusion in the Tutorial.
    2. Tom to rework the sections discussed based on comments from the group and provide to chair of the Tutorial working group (J21).
5. Next Steps.
- i. Chair reminded working group to complete assignments and upload output to iMeetCentral.
  - ii. Chair will follow up with members with open assignments.
  - iii. Chair will update assignment spreadsheet in iMeetCentral.
  - iv. Chair will complete controlled copy Draft 0, incorporating all vetted assignments.
  - v. Next meetings.
    1. TBD, 2024, Virtual Meeting
    2. September 9<sup>th</sup> – 12<sup>th</sup>, 2024, Scottsdale, AZ
6. Adjournment. Meeting Adjourned at 10:25am EDT. (Bracy Nesbit motioned to adjourn and Jason Buneo seconded the motion).

### **Meeting Participants:**

First Name	Last Name	Affiliation	Role*
Zeeky	Bukhala	GE Vernova	C
Jason	Buneo	GE Vernova	VC
Beckwith	Tom	Beckwith Consulting	M
English	William	Consumers Energy	M
Eruneo	Jason	Duke Energy	M
Kunze	Andrew	Enbridge	M
Nesbit	Bracy	Lower Colorado River Authority	M
Theron	Jacobus	GE Grid Automation	M
Weisz	Douglas	Beckwith Electric/Hubbell	M
Cintron Rivera	Jorge	US NRC	G
Hamilton	Randy	Basler Electric Co	G
Barksdale	Bailey	LCRA	G

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Brandt	Laurel	Tennessee Valley Authority	G
Tierney	Dennis	Calpine	G
Zaman	Malia	IEEE	G

\*M = Voting Member, NVM = Non-voting Member, G = Non-member/Guest, C = Chair, VC = Vice Chair, S = Secretary

**Next meeting:**

Request a double session for September meeting for 30 with projector. Avoid conflicts with (ranked by criticality):

1. J15, J21, J30, JTF28, KTF32
2. J16, J22, J26, J27 & K31
3. J25

Additionally, we request that our sessions be adjacent to J21

**Old Business (Virtual Meetings):**

Chair: Zeeky Bukhala

Vice Chair: Jason Buneo

Established: May 2021

Draft: -

Status: Virtual Meeting February 6, 2024

Expected Completion Date: December 2025

Working Group Status: Meeting 14

Assignment: To revise and update C37.96, Guide for AC Motor Protection

The Working Group held its thirteenth meeting on Tuesday, February 6<sup>th</sup>, 2024, with 9 members and 1 guest in attendance.

1. Welcome/Introduction
  - a) The Chair kicked off the meeting at 1:30pm EDT and welcomed members, this was followed by introductions.
  - b) Quorum check. 9 of 30 members were in attendance. Quorum was not met.
2. Approval of Meeting Minutes. Chair will seek approval of January, May, September, November 2023, and January and February 2024 minutes by email. 2023 minutes are already in circulation for approval. Chair will follow up.
3. Patent Slides.
  - a) Patent Slides were shared.

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- b) Chair provided an opportunity for attendees to identify patent claims or applications which they may be aware of that may be essential for the use of that standard and none was identified.
4. Assignments
- a) Jason Eruneo comments. Following were to follow up with Jason to give and make recommendations on his comments. Assignments were still pending.
- i. 5.5 Rotor Fault Protection – Will English
  - ii. 5.5 Rotor Fault Protection – Bracy Nesbit
  - iii. 5.6 – Bearing Protection – Nabil El Halabi
  - iv. 5.7 Abnormal Conditions – Nabil El Halabi
- b) 2 – Normative References – Sunil Kabra. Sunil went over his portion of Normative References. As new material is written, participants are reminded to keep Sunil up to date with any new references or reference changes.
- c) Annex B – Bibliography – Sunil Kabra. There was a discussion about the Bibliography. Mike Basler brought up that the IEEE 421, Exciter standard was not in the standard. Mike is not sure if IEEE 421 is used within the body of the document. Sunil will add IEEE 421, which will need to be examined since they are referenced as IEEE 421.1, IEEE 421.2, etc.
5. Next Steps.
- a) Chair reminded working group to complete assignments and upload output to iMeetCentral.
- b) Chair will update Assignments list and upload to iMeetCentral.
- c) Next Meetings
- i. March 5<sup>th</sup>, 2024 – Virtual
  - ii. April 2<sup>nd</sup>, 2024 - Virtual
  - iii. May 13<sup>th</sup> – 16<sup>th</sup>, 2024 - Buffalo, NY
6. Adjournment. Jason Buneo made a motion to adjourn, and Bracy Nesbit seconded it. Meeting adjourned

### Meeting Participants:

First Name	Last Name	Affiliation	Role*
Zeeky	Bukhala	GE Vernova	C
Jason	Buneo	GE Vernova	VC
Michael	Basler	Basler	M
Sirak	Belayneh	DC WATER	M
Jason	Eruneo	Duke Energy	M
Sunil	Kabra	Westinghouse Electric Company	M
Gary	Kobet	Tennessee Valley Authority	M
Bracy	Nesbit	Lower Colorado River Authority	M
Eli	Pajuelo	Pajuelo Electric Inc.	M
David	Reese		G



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\*M = Voting Member, NVM = Non-voting Member, G = Non-member/Guest, C = Chair, VC = Vice Chair, S = Secretary

Chair: Zeeky Bukhala

Vice Chair: Jason Buneo

Established: May 2021

Draft: -

Status: Virtual Meeting March 12, 2024

Expected Completion Date: December 2025

Working Group Status: Meeting 14

Assignment: To revise and update C37.96, Guide for AC Motor Protection

The Working Group held its fourteenth meeting on Tuesday, March 12th, 2024, with 8 members in attendance.

- i. Welcome/Introduction
  - a. The Chair kicked off the meeting at 1:30pm EDT and welcomed members, this was followed by introductions.
  - b. Quorum check. 8 of 30 members were in attendance. Quorum was not met.
- ii. Approval of Meeting Minutes. Chair will seek approval of January, May, September, November 2023, and January 2024 minutes by email. 2023 minutes are already in circulation for approval. Chair will follow up.
- iii. Patent Slides.
  - a. Patent Slides were shared.
  - b. Chair provided an opportunity for attendees to identify patent claims or applications which they may be aware of that may be essential for the use of that standard and none was identified.
- iv. Assignments
  - a. 5.5 Rotor Fault Protection – Jason Eruneo Comments
    - i. Will English reviewed Jason’s comments and uploaded a modified version to PSRC J22 WG PC37.96 - Project Home - iMeet Central.
    - ii. 5.5.1 Induction-Motor Protection. Will agreed with Jason’s comments to consolidate similar material in one place, Will moved the text in this paragraph to 7.2.10.8.2
    - iii. 5.5.2 Synchronous Motor Protection. Discussed synchronous motor field ground protection. The chair will poll the working group members for their thoughts on Jason’s comments.
    - iv. Figure 19 - Reviewed comment related to figure 19, regarding the ability of a 64F to detect field grounds at various points in the field winding.
      - a. We reviewed Mike Basler’s comments.

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- i. We discussed the proposed change to the definition of an SCR and believe the “terminology group” will be reviewing any terms changed or added. It was suggested to show this to Yuan Liao, in the I2 subcommittee for their thoughts.
  - ii. We discussed the suggestion to remove reference [B72] to the IEEE Committee Report, “Proposed Excitation System Definitions for Synchronous Machines”, ”IEEE Transactions on Power Apparatus and Systems, vol. PAS-88, pp. 1248– 1258, August 1969. Action: Mike Basler to review IEEE Std 421.1 for reference to this publication.
  - iii. 4.3.6.1, Brush-type (slip rings) – Bracy Nesbit comments. Reviewed comments related to the legacy diode connected in series with the 56 ac element. Bracy also commented on the new digital versions.
- v. Next Steps.
  - a. Chair reminded working group to complete assignments and upload output to iMeetCentral.
  - b. Next Meetings
    - i. April 2nd, 2024 - Virtual
    - ii. May 13th – 16th, 2024 - Buffalo, NY
- vi. Adjournment. Meeting Adjourned at 2:15pm EST.

### **Meeting Participants:**

First Name	Last Name	Affiliation	Role*
Zeeky	Bukhala	GE Vernova	C
Hasnain	Ashrafi	Sargent & Lundy LLC	M
Michael	Basler	Basler	M
Tom	Beckwith	Beckwith Consulting	M
William	English	Consumers Energy	M
Jalal	Gohari	WSP	M
Andrew	Kunze	Enbridge	M
Bracy	Nesbit	Lower Colorado River Authority	M

\*M = Voting Member, NVM = Non-voting Member, G = Non-member/Guest, C = Chair, VC = Vice Chair, S = Secretary

### **J23: Report on Generator Condition Monitoring**

**Chair: Steve Turner**

**Vice Chair: Rob Messel**

**Secretary: Open**

**Output: Report**

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**Established Date: May 2021**

**Status: (5-19-23)**

**Expected Completion Date: Open**

**Draft:**

### **Assignment:**

Develop a report that covers the following aspects of condition-based monitoring for synchronous machines:

- Use generator condition-based monitoring to detect potential problems before an actual fault develops and schedule maintenance.
- Describe and develop guidelines for online condition monitoring of large synchronous generators, including salient-pole rotors as well as cylindrical rotors.
- Provides information on online condition monitoring techniques as well as recommending thresholds to trigger alarms and initiate remedial or compensating action.
- Demonstrate how to use specific protection functions to monitor generators.
- Describe mechanisms of degradation and applicable monitoring devices. Work with other technical committees as necessary.

### **WG report**

The WG did not meet during this PSRC session.

### **Next meeting:**

Single session with accommodations for 20 people is requested.

### **J24: Report on Synchronous Generator Disturbance Recording**

**Chair: Shane Haveron**

**Vice Chair: JC Theron**

**Secretary: open**

**Output: Report**

**Established Date: January, 2022**

**Expected Completion Date: January, 2026**

**Draft: -NA**

**Assignment:** Establish a working group to publish a document on the use of disturbance recording for synchronous generators and critical associated auxiliary systems which will include: Digital Fault and Dynamic Disturbance Recorder basics, NERC disturbance monitoring and reporting requirements (PRC-002), detection of events and oscillations, and creation/handling of data files.

### **WG Report**

The working group met on 05/14/2024 at 9:20am EST with 6 people in attendance, 3 members and 3 guests. 3 out of 5 voting members present, quorum was achieved. Souvik Chandra and Bailey Barksdale were welcomed and added as voting members. New volunteers are always appreciated.

Proposed agenda was approved, motioned by Mike Basler and seconded by JC Theron. Minutes from September and January meetings were discussed and approved, motioned by Mike Basler and seconded

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by JC Theron. Participant behavior, patents, copyright, and WG assignment were discussed with no comments received.

The first draft of the report using the latest PES template was reviewed and will continue to be developed. When additional sections have been identified volunteers will be invited to contribute. Will English's PRC-002 contribution makes up section 3, JC Theron's contribution on generator signals to me measured makes up section 4, and the chair's contribution on disturbance recording basics makes up section 2.

The chair asked for fault records which show synchronous generation related issues, please request this during the J subcommittee meeting.

The WG enjoyed excellent discussions with great participation on:

- Microgrid applications with reciprocating engine synchronous generators and interaction with renewable resources connected using grid forming converters. Souvik Chandra agreed to look at what could be included in the report. Many thanks Souvik!
- Reciprocating engine synchronous generators in microgrids experiencing very large ROCOF conditions (20Hz/s) resulting in errors in computed values which use algorithms requiring a frequency measurement, for example true rms and phasor estimation. Mike Basler intends to revisit this at a later date.
- ERCOT grid performance during loss of generation or load due to the low inertia of the system. Frequency and voltage stability can threaten nuclear generation sites. Bailey Barksdale agreed to write a contribution including the NERC major event reports in the region. Many thanks Bailey!
- Lessons learned during analysis of the infamous Eastern Blackout of 2003 and the need for high quality synchronized data both for real time control decisions and for postmortem analysis.
- Alberta requires synchrophasor measurements every cycle at both the low and high sides of generation transformers to be kept in a one-year continuous buffer.
- Derrick Hass is continuing with his assignment to write a section on SSO detection, which is expected to take some time.

WG files and resources uploaded to ShareFile folder (<https://psrc.sharefile.com/home/shared/fo6be30c-453a-4e15-a84c-500b1c1cf436>). Volunteers can edit the report themselves or pass on changes to the chair for inclusion in the document.

### **Meeting Participants:**

First Name	Last Name	Affiliation	Role*
Bailey	Barksdale	LCRA	G
Mike	Basler	Basler Electric	M
Souvik	Chandra	Eaton	G
Will	English	Consumers Energy	G
Shane	Haveron	AMETEK Power Instruments	C
JC	Theron	GE	VC

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### Next meeting:

For the next meeting, a single session with accommodation for 10 people is requested. Please avoid conflicts with CTF?? (number to be assigned tomorrow by the C subcommittee), H46, H52, S15, P20, and all of J, particularly J16.

### **J25: Report on Synchronous Condenser Protection**

**Chair: Jason Eruneo**

**Vice Chair: Dale Finney**

**Secretary: open**

**Output: Report**

**Established Date: January, 2022**

**Status: 8<sup>th</sup> WG Meeting, Buffalo, NY May 14, 2024**

**Expected Completion Date: January, 2025**

**Draft: 4.2**

**Assignment:** Develop a report for Synchronous Condenser Protection. This report will discuss all aspects related to the protection of synchronous condensers. This includes design, settings, and protection schemes for synchronous condensers. Specifically, identify functions that apply to a synchronous condenser and refer to IEEE C37.102 for functions that align with the synchronous generator guidance.

### **WG Report**

WG met with 13 attendees. Nine (9) WG members and five (5) guests were present. There was a check for quorum and a quorum was established.

A motion to approve January meeting minutes was made by Laurel Brandt and seconded by Russ Patterson. January 2024 Meeting Minutes were approved unanimously by the WG

Various PSSE Simulations for synchronous generator/synchronous condenser loss off os synchronism were presented:

- The first simulation involved 5 hydro machines operating in condense mode interconnected to a 161kV switchyard. A three-phase fault was placed near the HV terminals of the generator step up (GSU) transformer (on an adjacent transmission line)
  - The fault was cleared in 6 cycles
  - All of the machines remain stable and do not slip a pole
  - All generators recover and maintain stability after the transmission line circuit breaker opens

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- The second simulation consisted of the previous system design but increased the fault clearing time to 13 cycles
  - All of the machines remain stable and do not slip a pole
  - All generators recover and maintain stability after the transmission line circuit breaker opens
- The third simulation modified 4 of the machines to operate as synchronous generators with full real power output while 1 machine remained in condense mode. A three-phase fault was placed on the adjacent transmission line.
  - The fault was cleared in 6 cycles
  - The 4 synchronous generators lose synchronism with the transmission system and slip a pole (go out of step).
  - The condenser remained stable and did not slip a pole. It was mentioned that the condenser is connected to a strong system and is tracking the system voltage
- **Action Item: Gary Kobet** will re-run the simulations with a weak system configuration to see how the synchronous condenser reacts to this fault scenario.

The working group discussed that while the WG can't produce a simulation where the units are going out of step. However, it was discussed the weak systems such as those dominated by inverter-based resources are difficult to fully test. The working group recommends setting a very secure out of step scheme in the event that it does occur.

The working group discussed that the WG has not been able to produce a simulation, with a high degree of confidence, where the units are going out of step. However, it was discussed the weak systems such as those dominated by inverter-based resources are difficult to fully test. The working group recommends setting a very secure out of step scheme in the unlikely event that it does occur.

The working group reviewed the definitions (in section 3.10.1) which have been proposed by Ritwik. The WG agreed on the definitions.

**Action Item: Jason Eruneo** Any time the term "Synchronous Generator" is in the report it will be replaced with "Synchronous Machine"

The WG discussed an IBR generating facility with a synchronous condenser connected to the facilities collector bus.

- A fault was applied to the interconnecting line of the facility. The simulation shows that the condenser slips a pole
- However, there are a lot of questions about the underlying engineering reasoning and validity of the results
- The WG decided not to include the IBR generating facility simulation example in the report due to the likelihood of model inaccuracies

**Action Item: Gary Kobet and Laurel Brandt** to review and provide an update on pole slip versus out of step protection on a TVA unit.

### Meeting Participants:

First Name	Last Name	Affiliation	Role*

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Jason	Eruneo	Duke Energy	C
Laurel	Brandt	TVA	M
Steven	Mueller	Ameren	M
Ryan	Carlson	Burns & Mcdonnell	M
JC	Theron	GE	M
Ding	Lin	Manitoba Hydro	G
Ritwik	Chowdhury	SEL	M
Doug	Weisz	Hubbell/Beckwith	G
Zeeky	Bukhala	GE	M
Randy	Hamilton	Basler Electric	G
Abu	Zahid	Hydro One	G
Kamal	Garg	SEL	G
Russ	Patterson	Qualus	M
Gary	Kobet	TVA	M

\*M = Voting Member, NVM = Non-voting Member, G = Non-member/Guest, C = Chair, VC = Vice Chair, S = Secretary

**Next meeting:**

For our next meeting we request a single session with room for 30 people and a projector

- Request to avoid conflicts with D29 and K31

**J26: Summary Paper - Modeling of Generator Controls for Coordinating Generator Relays**

**Chair: Juan Gers**

**Vice Chair: Phil Tatro**

**Output: Summary Paper**

**Established Date: January 12, 2022**

**Status: 7<sup>th</sup> WG Meeting May 14, 2024**

**Expected Completion Date:**

**Draft: -**

**Assignment:** Write a summary paper of the J13 report, Modeling of Generator Controls for Coordinating Generator Relays.

**WG Report**

The working group met in one session on Tuesday 14th, with 7 participants, out of them, 3 members and 4 guests. A quorum was not achieved.

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Juan Gers presented the latest version of the paper, that has seven pages, in two-column format according to the IEEE template. The ballot comments sent up to end of last week were discussed and implemented. Comments from two members of the J Subcommittee were received last Monday.

Will English suggested to review and implement as soon as possible the corresponding changes and then circulate the paper again among Members of the Group and afterwards in the J Subcommittee. The proposal was approved. The chairman will implement the changes with the help of some members of the J26 group as required and then will circulate the paper again.

### Meeting Participants:

First Name	Last Name	Affiliation	Role*
Juan	GERS	GERS	C
Will	English	Consumers Energy	G
Mike	Basler	Basler	M
Nallan	Kumar	SEL	G
Libin	Varshese	NYPA	G
Deepak	Maragal	LND TS	G
Nader	Safari-Shad	VW-Platteville	M

\*M = Voting Member, NVM = Non-voting Member, G = Non-member/Guest, C = Chair, VC = Vice Chair, S = Secretary

### Next meeting:

The requirements for the next meeting are a single session, a meeting room for 30 people, and a computer projector.

### J27: Summary Paper - Revision of C37.106, Guide for Abnormal Frequency Protection for Generating Units

**Chair:** Bracy Nesbit

**Vice Chair:** Jay Mearns

**Output:** Summary Paper

**Established Date:** May 11, 2022

**Status:** 6<sup>th</sup> Meeting May 14, 2024, 10:40am

**Expected Completion Date:**



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**Assignment:** Write a summary paper of IEEE Standard PC37.106 Guide for Abnormal Frequency Protection for Power Generating Units.

### WG Report

**Attendance:** 9 – 6 members and 3 guests

C-Bracy Nesbit -LCRA, G-Will English - CMSEnergy, M-Derrick Haas-SEL, M-Raju-Alla-SEL, M-Sunil Kabra – Westinghouse, M-Steve Conrad – Retired, M-Zeeky Bukhala-GE, G-Brad Odums-LCRA, G-Scott Sweat-Westinghouse

Check for Quorum – 2/11 members present. Quorum not met.

Approval of agenda: reviewed – no comments/changes.

IEEE SA Patent Policy was presented, and that the call for patents occurred and any responses to such Call. **Reviewed no comments.**

IEEE SA Copyright Policy presentation was presented or made available prior to the meeting. **Reviewed no comments.**

Approval of minutes of previous meeting: Not approved. Chair will send out for email approval.

### Technical topics

- The working group reviewed the assigned paper updates:
  - Steve Conrad – review terminology in the section V. Summary and recommend needed changes.
  - Sunil Kabra – Incorporate additional narratives on Guide changes into section I. Introduction.
- No additional changes were made.

The WG reviewed the draft presentation of the summary paper.

### Action items

- Bracy – Assemble Summary Paper updates and send to WG for balloting.
- Bracy – Send current form of Abstract with paper for WG balloting.
- Bracy – Send draft presentation to WG for additional comments and preferences.
- WG - Paper and Presentation ready for presenting to committee for approval at future meeting.

Any items reported out of Executive Session – nothing to report.

Recesses and time of final adjournment: 11:30am

### Meeting Participants:

First Name	Last Name	Affiliation	Role*
Bracy	Nesbit	LCRA	C

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Steve	Conrad	Retired	M
Dennis	Tierney	Calpine	G
Bailey	Barksdale	LCRA	G
Jorge	Cintron	NRC	G
Erin	Jessup	SEL	G

\*M = Voting Member, NVM = Non-voting Member, G = Non-member/Guest, C = Chair, VC = Vice Chair, S = Secretary

**Next meeting:**

Single session. With room for 15 and a projector. Please avoid conflicts with other J meetings.

**JTF28: Prepare J6, J14 Papers for Publication**

**Chair: Zeeky Bukhala**

**Vice Chair: Dale Finney**

**Established Date: May 11, 2022**

**Status: Task Force 5<sup>th</sup> Meeting May 14, 2024**

**Expected Completion Date:**

**Assignment:** Address potential copyright issues arising from the use of significant word-for-word sections of IEEE transactions papers on which the reports were developed. Appropriate citation and formatting of the word-for-word sections and figures will be added. Format both papers in PES format.

**Task Force Report**

The Task Force held its fifth meeting on Tuesday, May 14<sup>th</sup>, 2024, with 3 members and 1 guest in attendance.

- I. Welcome / Introductions. The Chair kicked off the meeting at 8:00am EDT and welcomed attendees to the task force's fifth meeting.
- II. Approval of Meeting Minutes. Quorum was not met. Chair will circulate January, May and September 2023 and January 2024 minutes for approval by email.
- III. J6 - Protection issues Related to Pumped Storage Hydro (PSH) Units Update.



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**Vice Chair: Mike Thompson**

**Secretary: open**

**Output: Summary Paper**

**Established Date: May, 2024**

**Status: 1<sup>st</sup> WG Meeting, Buffalo, NY May 14, 2024**

**Expected Completion Date: January, 2026**

**Draft:**

**Assignment:** Write a conference paper summarizing the major improvements in the newly revised, C37.102, IEEE Guide for AC Generator Protection and prepare a presentation for use in presenting the paper.

### WG Report:

WG met with 9 in-person attendees and 6 guests. As this was a first meeting, all attendees who requested membership were added to the roster as voting members. There was no check for quorum.

The chair defined that the deliverables for the WG were:

- An abstract suitable for obtaining acceptance at regional relay conferences
- A 7 to 8 page paper
- A 30 minute slide presentation

The chair presented a proposed schedule for discussion. It was the consensus of the WG that attempting to have an abstract and draft paper ready for submittal to the Ga Tech and Texas A&M relay conferences by October, 2024 for the spring of 2025 was too aggressive. With that goal, if accepted, the final paper would need to be complete shortly after the January, 2025 meeting. This would give us only two face-to-face meetings to complete the work. The WG decided to shoot for having the abstract and paper in WG ballot draft form by the call for papers deadline for WPRC relay conference, typically in April of 2025. This would allow time for resolution of WG ballot and J SC ballot comments in time for presentation in October of 2025.

Bracy Nesbit cautioned the WG to focus on what changed in the guide and not what is in the guide.

The chair presented a draft abstract and outline for discussion. The abstract was based on the summary section in the preface portion of the guide. The abstract was approved with the addition of including a sentence mentioning that the section on application of multifunction generator protection had been removed. The chair took the action item to make that addition to the abstract and present to the WG for approval at the next in-person meeting in Scottsdale AZ.

The WG went over the outline and made adjustments in sections. The discussion was wide ranging. Some pertinent points were made:

- Focus on new protection philosophies that have come into practice since 2006.
- Mention changes that improved clarity on existing practices.
- It is OK to cite other reports such as the J12 report on improved stator ground fault schemes but in the context that they were feeders to new understandings that guided improvements to the guide.

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- The approach of this summary paper should try to be consistent with other summary papers coming out of the Committee.
- It is interesting if the writeups discuss some of the history and discussions that led to changes in the guide. But it was cautioned that doing too much original writing could delay getting a draft ready by early next year.

Some members volunteered to draft sections from the initial outline. But then it was decided that the outline needed to be better solidified before moving to that step.

Steven Mueller, Laura Brandt, and Bracy Nesbit volunteered to work together to refine the outline based on discussions. The revised outline will be sent out to the WG for review prior to a meeting, tentatively scheduled for June 14th. At that meeting, writing assignments would be made to start production of the paper contingent upon WG approval of the revised outline.

A motion to adjourn was made by Bracy Nesbit and seconded by Jason Buneo. The WG voted to adjourn.

### Meeting Participants:

First Name	Last Name	Affiliation	Role*
Steven	Mueller	Ameren Transmission	C
Michael	Thompson	SEL	VC
Bracy	Nesbit	LCRA	M
Ryan	Carlson	BMCD	G
Ding	Lin	Manitoba Hydro	G
Jason	Eruneo	Duke Energy	M
Randy	Hamilton	Basler Electric	G
Bailey	Barksdale	LCRA	M
Jorge	A Cintron Rivero	NRC	G
Jason	Buneo	GE Vernova	M
Will	English	Consumers Energy	M
Dennis	Tierney	Calpine	G
Laurel	Brandt	TVA	M
Nestor	Casilla	Doble	G
Ritwik	Chowdhury	SEL	M

\*M = Voting Member, NVM = Non-voting Member, G = Non-member/Guest, C = Chair, VC = Vice Chair, S = Secretary

### Next meeting:

For our next meeting we request a single session with room for 20 people and a projector.

The time slot for this meeting was adequate and did not appear to conflict with other WG's.

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However, request to avoid conflicts with J16 (C37.101 Revision), J25 (Sync. Cond. Report), J27 (C37.106 – summary paper), K31 (C37.119 revision), B10 and C50.

### **Liaison Reports:**

**Electric Machinery Committee – M. Yalla, R. Messel – No report**

**Industry Applications Society (IAS) / Industrial & Commercial Power Systems (I&CPS) – D. Haas – Nothing to report**

**Nuclear 1E WG – P Kumar – PAR for P741 was approved in March 2022. Established two task forces to address each area of the proposed PAR:**

- **Task Force #1 - Impacts of power quality on Class 1E systems**  
Note: IEEE PSCSC has offered their support for the “Power Quality” Task Force effort. Charles Sufana is one of the principal authors of the PSCRC WG K11 Topical Report on Open-Phase Guidance for Nuclear Stations. Mr. Sufana stated that he is available via phone or virtual meetings as needed.
- **Task Force #2 (Address previous ballot comments)**

### **Old Business:**

**J20 PSRC Officer Ballot Results – Report was approved with comments. Comments were incorporated and the report was approved on a recirculation ballot.**

**JTF29: J SC Scope Investigation – Gary Kobet has agreed to act as chair for this task force. The task force will begin meeting at the September 2024 PSRC meeting.**

**IEEE Tutorial on the Protection of Synchronous Generators Future Revision – The subcommittee will consider revising this in the future to align with the C37.102-2024 revisions.**

**Report Language Usage – Subcommittee leadership recommended that WG chairs utilize the IEEE style manual as a reference for word usage. It was expressed that there may be challenges obtaining ballot approval for language that is deemed too strong.**

### **New Business:**

**New J Subcommittee Membership – Laurel Brandt, Steven Mueller, Mike Basler were added to the J subcommittee roster as voting members.**

**Generator Event Presentation – A presentation was provided to the subcommittee for an actual out of step event on a synchronous generator. A single phase to ground fault at the generator step up transformer high side evolved into a 3-phase fault and resulted in the generator going out of step (OOS) with the interconnecting system. The evolution of the fault**

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resulted in a unique impedance swing trajectory that resulted in the OOS scheme not initiating a trip until after the first pole slip. It was also determined that the time delay setting associated with the OOS scheme blinders was too slow for the actual speed of the impedance swing.

### Adjournment:

Motion to adjourn was made by Zeeky Bukhala and seconded by Steve Conrad. The meeting was adjourned at 2:35 PM EDT.

### Meeting Participants:

First Name	Last Name	Affiliation	Role*
Will	English		C
Jason	Eruneo	Duke Energy	VC
Tom	Beckwith		M
Zeeky	Bukhala	GE Vernova	M
Jason	Buneo	GE Vernova	M
Ryan	Carlson	Burns & McDonnell	M
Ritwik	Chowdhury	SEL	M
Stephen	Conrad	Retired	M
Manish	Das	GE Vernova	M
Juan	Gers	GERS USA	M
Randy	Hamilton	Basler Electric Co	M
Wayne	Hartmann	GE Vernova	M
Gene	Henneberg	NV Energy	M
Gary	Kobet	TVA	M
Hugo	Monterrubio	Beckwith Electric	M
Bracy	Nesbit	Lower Colorado River Authority	M
Jacobus	Theron	GE Vernova	M
Michael	Thompson	SEL	M
Doug	Weisz	Beckwith Electric/Hubbell	M
Fred	Agyekum	SEL	G
Mike	Basler	Basler Electric Company	M
Laurel	Brandt	TVA	M
Joshua	Hughes	Qualus	G
Steven	Mueller	Ameren	M
Dennis	Tierney	Calpine	G
Nallan	Kumar	SEL	G
Bailey	Barksdale	LCRA	G

\*M = Voting Member, NVM = Non-voting Member, G = Non-member/Guest, C = Chair, VC = Vice Chair, S = Secretary

**K Substation Protection Subcommittee Meeting Notes,  
Wednesday May 15<sup>th</sup>, 2024, 4:20pm – 5:45pm EST – Buffalo, NY**

**Chair:** Adi Mulawarman

**Vice-Chair:** Brandon Davies

**Scope:** Evaluate and report on methods used in protective relaying of substations and the consumer or independent power producer, associated equipment and performance of these protective systems. Develop and maintain relaying standards that relate to this equipment and the utility-consumer interface.

- **Introductions**
- **15 members and 17 guests were in attendance**
- **Check for quorum 15 out of 29 members, need 15 for quorum), quorum was made**
- **Approval of agenda (Sebastien B. motioned, Gene H. seconded, approved unanimously)**
- **Approval of previous meeting minutes (Staish S. motioned, Jeff B. seconded, approved unanimously)**
- **Advisory Committee items of interest**
  - 209 attendees indicating PSRC as primary area of interest
  - Future meetings:
    - Sep 2024 – Scottsdale, AZ
    - January 2025 – Garden Grove, CA
    - May 2025 – Portland, OR
  - Please register for meetings early – late registration is challenging to manage
  - P&P requires that meeting minutes for SC, WGs and TF require a list of attendees. Name and affiliation are required, membership status is also recommended.
  - B5 Publicity Working Group – Looking for support to support activities about recruiting new PSRC team members
  - WG Chairs and Vice Chairs, please let Jim know ASAP if you are not going to hold a working group meeting as it helps with meeting coordination and scheduling.
  - Please provide meeting minutes to Brandon by May 24th. Please use template to allow for easier incorporation into the subcommittee minutes.

**Working Group Reports:**



**K12: PC37.431.20 IEEE Guide for Protecting Transmission Dynamic Reactive Power Compensators****Chair: Satish Samineni****Vice Chair: Tapan Manna****Secretary: -****Output: Guide****Established Date: 2013****Expected Completion Date: 2025****Draft: 27**

**Assignment:** To work jointly with Substations WG I9 to write a guide for protecting transmission dynamic reactive power compensators. PSRC WG K12 will provide guidance and review on topics that are already covered in other IEEE guides to prevent overlap and identify areas where interpretation of existing guides is necessary to meet the specific application challenges unique to transmissions dynamic reactive power compensators.

**Meeting Notes:**

PSRC WG K12 had a meeting on Tuesday, May 14th, 2024. K12 had 2 members and 3 guests present. Quorum was not met. January meeting minutes will be approved through email.

- Provided an update from WG I9 from last week.
  - MEC review of the draft is complete and provided the feedback
  - SC I9 is currently reviewing the MEC feedback and indicated that they might reach us for resolving some of the feedback
  - Plan is to resolve the comments and initiate the SA ballot
- For the next in-person meeting we request a single session with room for 10. Please avoid timing conflict with KTF32, K25, K31.

**Attendees:**

<b>Name</b>	<b>Membership</b>	<b>Affiliation</b>
Satish Samineni	Chair	SEL
Tapan Manna	Vice-Chair	Burns & McDonnell
Brandon Davies	G	TRC
Kamal Garg	G	SEL
Greg Hataway	G	Burns & McDonnell
Chase Lockhart	G	Burns & McDonnell

**K25: PC37.99 IEEE Guide for the Protection of Shunt Capacitor Banks****Chair: Rick Gamble****Vice Chair: Mat Garver****Secretary: Brandon Lewey****Output: Guide****Established Date: January 2019****Expected Completion Date: 2025****Draft: 1.1****Assignment:** Revise and Update C37.99, IEEE Guide for the Protection of Shunt Capacitors**Formalities:**

- The WG met on 05/14/2024.
- Officer presiding – Rick Gamble
- The meeting was called to order by the Chair.
- Introductions were made.
- The meeting was attended by 17 voting and 11 non-voting members.
- Quorum was met.
- May 2024 Agenda was approved.
- Meeting Minutes from January 2024 were reviewed and approved.
- Chair reviewed the Patent, Copyright, and Participation Behavior Code of Ethics slides.
- Summary of discussions and conclusions including any motions:
  - The latest (converted) draft is now on iMeetCentral.
    - Link here: <https://ieee-sa.imeetcentral.com/pc3799/>
    - Navigate to Files & Discussion > Draft Documents > Drafts in Progress. It's the file called "pc37.99\_d1.1 (Latest).docm"
    - A lot of the tables, equations, headings, etc. were updated.
    - This will be our working document going forward.
    - References were updated on previous version of draft.
  - The PAR Extension was approved at the December 5<sup>th</sup> NES Com, allowing us to work until the end of 2025.
  - Schedule:
    - WG finishes work by end of 2024, including WG balloting.
      - WG prefers Friday mornings for off cycle meetings. Submit guide for balloting by early 2025.
      - Submit guide for balloting by early 2025.
      - WG resolves comments early to mid-2025 and resubmits.
      - Complete by end of 2025.
  - Items Discussed:
    - Reviewed comments on Section 8.1 & 8.2
    - 1990 graph and the need for explanations on equations
    - 46 directional element and section addition
    - Removing Section 9 and adding a reference to other developed guides
    - Possibility of revising Section 7.2.2 regarding overvoltage coordination
    - Add/revise faulted phase section
    - Add/revise CTR selection WG Adjourn
- WG Adjourn

**Action Items:**

- Ensure all voting members have access to iMeetCentral.
- Revise 46 directional element section
- Review rest of Section 8
- Section 7.2.2 revision
- Faulted phase section
- CTR selection requirements

**Attendees:**

<b>Name</b>	<b>Membership</b>	<b>Affiliation</b>
Seth Barnes	Guest	TVA
Tim Condra	Guest	TVA
Stephen Conrad	Voting Member	Public Service Co of NM - Retired
Brandon Davies	Non-Voting Member	TRC
Richard Gamble	Chair	TVA
Mat Garver	Vice-Chair	Beckwith Electric/Hubbell
Andrew Kunze	Voting Member	Minnesota Power
Brandon Lewey	Secretary	Ameren
Matthew Leyba	Guest	GE
Tapan Manna	Voting Member	Burns & McDonnell
Pratap Mysore	Voting Member	Pratap Consulting Services LLC
Andrew Nguyen	Voting Member	Tennessee Valley Authority
Claire Patti	Voting Member	Portland General Electric
Juan Pineros	Voting Member	XM S.A. Colombia Power System Operator
Christopher Walker	Voting Member	Mesa Associates, Inc
Fred Agyekum	Non-Voting Member	Schweitzer Engineering Laboratories, Inc.
Koustubh Banerjee	Guest	Commonwealth Associates, Inc
Sebastien Billaut	Guest	Commonwealth Associates, Inc
Matthew Black	Guest	Sargent & Lundy LLC
Arthur Buanno	Voting Member	FirstEnergy
Muhammad Hamid	Voting Member	Black & Veatch
Hillmon Ladner Garcia	Voting Member	Southern Company
Melvin Moncey Joseph	Voting Member	Burns & McDonnell
Adi Mulawarman	Guest	Xcel Energy
Paras Patel	Guest	TRC
Satish Samineni	Voting Member	Schweitzer Engineering Labs
Dean Sorensen	Voting Member	National Grid
Faris Elhaj	Guest	Burns & McDonnell

**K26: C37.109 IEEE Guide for the protection of Shunt Reactors****Chair: Kamal Garg****Vice Chair: Ilia Voloh****Output: Guide****Established Date: Aug 2019****Expected Completion Date: 2023****Draft: Final (Published)****Assignment: Revise and update the C37.109 Guide**

K26 did not meet. The C37.109 guide has been published and work is complete and has disbanded.

**Motion to K Subcommittee by Kamal Garg, Seconded by Pratap Mysore****Motion:** *Working Group K26 motions to disband.***Motion passed unanimously.**

**K27: C37.95 IEEE Guide for Protective Relaying of Utility-Consumer Interconnections****Chair: Paul Elkin****Vice Chair: Hillmon Ladner****Secretary: NA****Output: Guide****Established Date: January 2020****Expected Completion Date: December 2024****Draft: 3, December 15, 2023****Assignment:** Review and update C37.95 IEEE Guide for Protective Relaying of Utility-Consumer Interconnections**K27 did not meet, but provided an update on the status of the work, see below:****Notes:**

- Ballot body has been formed. Comment period opened 5/9/2024.
- Comment Period Closes 6/8/2024
- Statistics as of 5/15/2024
  - 91 Ballot Body Members
  - 18 Votes to Approve
  - 0 Disapprove
  - 2 Comments received so far.
- We hope to complete the guide revision on schedule. We will evaluate our timeline once we receive ballot comments and will determine if a PAR extension is required before the September 2024 IEEE PSRC meeting.

**K29 WG: Write PES technical report based on K3 report entitled ‘Reducing outage durations through improved protection and autore restoration in distribution substations’.****Chair: Sebastien Billaut****Vice Chair: Mohamed Zedeh****Secretary: Colleen Konsavage****Established: 2021****Output: Revised technical report to the K Subcommittee****Expected Completion Date: May 2025****Draft: 1****Assignment:** Create a PES technical report based on the K3 report entitled ‘Reducing outage durations through improved protection and auto restoration in distribution substations’.**Meeting Notes**

- Agenda is presented.
- Quorum is not reached with 4 of 14 voting members.
- Members approve the September 2023 minutes of the meeting.
- Motion to approve the last meeting minutes. First by Brian Boysen, seconded by Rafael Garcia. Non opposed. Minutes approved.
- Shivam Prabhakar has not provided his contribution on re-trip, though he has not been able to attend the last two meetings. Swagata Das offered to try to start this contribution. The Chair will email both so Shivam can collaborate with Swagata if he still desire to contribute.
- Priya Ragburaman offered a discussion on tripping TC2 on the fact that is switchgear breaker there is a physical limitation allowing tripping through the Trip Coil 2 to be of the same speed as trip coil 1. Priya offered to provide a reference on this information.
- Bernard Matta volunteered to contribute on “Differential via direct input CT (instead of summed CTs)”.
- Mohammad Zadeh and Sudarshan B volunteered to review the contributions to REF.
- Don Ware will review the report, provide a contribution for distribution bus configuration impact on reducing outage duration, and see if they can contribute.
- The chair discussed adding a section on using IEC61850 GOOSE messaging to implement complex wiring schemes such as multi-bus interlock systems or station LTC paralleling determination schemes. The Chair will provide this contribution for consideration to be added to the draft.
- The meeting adjourned on time
- For the next meeting, we will need a projector and a room for 20. Avoid conflict with D35, D38, D30, D42, D44, D47, K33, K35, C45

**Attendance:**

<b>Name</b>	<b>Membership</b>	<b>Affiliation</b>
Sebastien Billaut	Chair	Commonwealth Associates Inc
Don Ware	M	Qualus
Angelo Tempone	G	Duke
Swagata Das	M	SEL
Priya Ragburaman	M	Siemens
Adi Mulawarman	G	Xcel Energy

**K31: Revision to C37.119 IEEE Guide for Breaker Failure Protection of Power Circuit Breakers.****Chair : Vahid Madani****Vice Chair : Brandon Davies****Established: 2022****Output: Guide****Expected Completion Date: 2026****Assignment: Revise C37.119-2016, IEEE Guide for Breaker Failure Protection of Power Circuit Breakers****Draft: 3.0****Summary:**

- Met with 37 attendees
- 15 of 20 Voting Members were in attendance - Quorum was achieved
- Internal recirculation, of Draft 3.0, completed in time for the WG to assess progress
- The WG plans to continue to leverage web meetings to maintain schedule
- IEEE SA ballot process and P&P process were discussed. WG members will follow the IEEE SA guidelines.
- Based on feedback from the WG member, and review of the project plan, WG anticipates to seek the K SC approval, via on-line vote around mid-July, and about the same to initiate forming SA balloting group. WG appreciate support from the SC members with their approval.
- Meeting room request for 35 attendees. Request to avoid conflict with B3, WG J25, WG C26 and WG C50. A room with A / V conferencing equipment is preferred if available.

**Details:**

- Agenda was presented and reviewed – A motion to approve the agenda was made. No comments or discussion and no other topics were proposed to include.
- Patent Slides were presented, no patents were identified
- Copyright and Attendee Ethics slides were presented and reviewed
- PAR Purpose and Scope were reviewed
- WG Chair presented the overview of the Draft 3.0 internal ballot comments. From the feedback received, from the WG members and discussions at the May (this) meeting, it looks like the technical comments can be addressed efficiently with 1-2 web meetings. The editorial and general comments are being reviewed by the WG officers; those requiring WG discussions or coordination with the person that has provided the comment will be discussed at the WG meetings (web or in-person).
- WG Chair presented the updated project plan. WG is making good progress. WG members plan to leverage web meetings to maintain schedule.
- Next the WG members discussed some of the Draft 3.0 ballot recirculation comments.
  - Two different versions of the Figure 2.0 Logic Diagram reviewed (breaker status disagreement). Both diagrams are correct. The proposed version (submitted as part of internal ballot on Draft 3.0) is simpler to follow since does not use negated Logic Symbols for output of the GATED logic. WG voted to adopt the proposed logic diagram.
  - Several other comments were reviewed and resolved
  - Attendees discussed Annex B comments to be discussed in a web meeting. Plan is to arrange in the next couple of weeks after the PSRC meeting.
- The meeting adjourned at 10:30AM EST.

**Action Items:**

- WG will coordinate a meeting go over comments related to the timing diagram in Annex B
- WG will assess timing for formation of the SA balloting group in June
- WG officers will submit a request for K SC approval with a version of the draft WG members agree to, and in accordance with P&P manual 7.1.2a and SA 7.1.1 for SC approval

**Attendance:**

<b>Name</b>	<b>Membership</b>	<b>Employer</b>
Abu Bapary	NVM	AEP
Alla Deronja	VM	American Transmission Co.
Andrew Nguyen	NM	TVA
Andy Kunze	NM	MN Power
Austin Wade	NM	SEL
Bernard Matta	VM	SEL
Binaya Joshi	NM	CAI Engineering
Brandon Davies (Vice Chair)	VM	TRC
Bruce Mackie	NM	Northern AZ
Charlie Sufana	NM	
Chris Walker	VM	Mesa Associates
Claire Patti	NVM	Portland General Electric
Don Lukach	VM	Ameren
Don Ware	VM	Qualus Corp
Erin Jessup	NM	SEL
Faris Elhaj	NM	Burns & McDonnell
Gene Henneberg	VM	NV Energy
Gereg Hataway	NM	Burns & McDonnell
Hillmon Ladner-Garcia	VM	Southern Co.
Jack Jester	NM	Exelon Corp
Jason Burno	NM	GE Verona
Jason Eruneo	VM	Duke Energy
Jeffrey Barsch	NVM	AEP
Jorge A Cintron Rivera	NM	NRC
Juan Pineros	NM	XM Columbia Power System Operator
Machelle Harris	NM	Burns & McDonnell
Mark McChesney	NM	Oncor
Matt Black	NM	Sargent & Lundy
Michael Thompson	VM	SEL Eng. Services
Muhammad Hamid	NM	Black & Veach
Satish Samineni	VM	SEL
Shivam Prabhakar	VM	Siemens
Thomas Miller	NM	ITC
Vahid Madani (Chair)	VM	GridTology
Yujie Yin	VM	Quanta-Technology



**KTF32: Investigate need for separate guide for protection of filter banks****Chair : Satish Samineni****Vice Chair : N/A****Output: Recommendation to K Subcommittee****Established: 2023****Assignment: Task force to exploring the need of creating a separate guide for protection of filter banks.**

- PSRC KTF32 had a meeting on Tuesday, May 14th, 2024. KTF32 had 6 attendees.
  - Provided an update from the Capacitor Subcommittee. They are interested in this activity and wanted to collaborate as a co-standards committee.
  - We discussed next steps – plan is to have web meetings to review the material for finalizing the scope and start the PAR activity before the September meeting.
- For the next in-person meeting we request a single session with room for 20. Please avoid timing conflict with K12, K25, K31.

**Attendance:**

<b>Name</b>	<b>Membership</b>	<b>Employer</b>
Satish Samineni	Chair	SEL
Paras Patel	-	TRC
Brandon Davies	-	TRC
Matthew Leyba	-	GE Vernova
Jason Bune0	-	GE Vernova
Nallan Kumar	-	SEL

**KTF33: C37.234 Corrigendum for Ungrounded Bus Protection****Chair : Sebastien Billaut****Vice Chair : N/A****Output: Recommendation to K Subcommittee****Established: 2023****Assignment: Explore the need to amend C37.234 Bus Guide regarding the stabilization of ungrounded buses with large or unbalanced shunt capacitance****Meeting Notes:**

- The Chair, Sebastien Billaut, proposed that the TF would work on drafting the updated motion to the subcommittee. The TF would also work on drafting the scope and purpose of the PAR to be submitted.
- We had good discussions about the wording to tune the language. We discussed specifying that the capacitance would be called Stray capacitance, as it would be in most cases. We decided against having this in the scope and purpose but expect this discussion to be part of the content of the amendment.
- Eventually, we settled on the wording, and with no opposition in the TF, we agreed to submit the text to the subcommittee.

**Attendance:**

<b>Name</b>	<b>Membership</b>	<b>Affiliation</b>
Sebastien Billaut	Chair	Commonwealth Associates
Steve Conrad	-	Retired
Hillmon Ladner	-	Southern Company
Adi Mularwarman	-	Xcel Energy
Stephen Miller	-	E2I
Robert James	-	PG&E
Kamal Garg	-	SEL
Muksel Nagpal	-	Burns & McDonnell
Sudarshan Byreddy	-	Burns & McDonnell
Dean Sorensen	-	National Grid
Ajmal Saeed	-	PG&E
Brandon Davies	-	TRC
Koustubh Banerjee	-	Eversource Energy

**KTF33 Motion to K Subcommittee by Sebastien Billaut, Seconded by Hillmon Ladner-Garcia**

**Motion:** *KTF 33 motions to form a working group with the assignment to submit a PAR and to prepare amendment to IEEE C37.234-2021 Guide for Protective Relay Applications to Power System Buses, to add a statement to limit the applicability of clause 8.3 to ungrounded systems with largely balanced shunt capacitance to ground and to add guidance on systems with large unbalance shunt capacitance.*

**Scope:** *This amendment to IEEE C37.234-2021 Guide for Protective Relay Applications to Power System Buses limits the applicability of clause 8.3 to ungrounded systems with largely balanced shunt capacitance to ground and adds guidance on systems with large unbalanced shunt capacitance.*

**Purpose:** *When ungrounded buses have a large shunt capacitance unbalance, the resistor's role is not limited to stabilizing the bus voltage. Large shunt capacitance unbalances will lead to a stable unbalanced voltage that may lead to difficulties in identifying faulted conditions when the zero sequence voltage becomes large. A larger resistor power rating and a lower resistor impedance value can allow for more reasonably balanced phase voltages by limiting zero-sequence voltage across the resistor or other mitigation solutions.*

**Motion Passed Unanimously, Working Group K33 will meet in September to start this work.**

**K34: Summary Paper C37.109 IEEE Guide for the protection of Shunt Reactors****Chair : Kamal Garg****Vice Chair : Iliia Voloh****Output: Summary Paper****Established: 2024****Assignment: Develop a summary paper for the updated C37.109 guide.****Meeting Notes:**

- Second meeting – Total 15 people. (10 people in room and 5 remotely). Total 11 voting members, 10 voting members joined the meeting.
- K26 group finished the work and C37.109 2023 draft on IEEE Explore. K26 will be closed after the May meeting. Email sent to all K26 members.
- K34 comments were received. Some discussion on references and figures. Some minor additional language adjustments.
- K34 summary paper is already approved for WPRC 2024 and will be possibly approved for MIPSYCON 2024. Planning for Texas A&M and Georgia Tech in 2024. Nabil expressed interest in presenting for IEEE conference in Gulf countries.
- Briefly discussed Offshore reactor application by Orsted.
- WG approved to send the summary paper for subcommittee approval. The summary paper copy was sent with comments spreadsheet to K subcommittee officers.
- Adjourn 10:00 AM EST.

**Attendance:**

<b>Name</b>	<b>Membership</b>	<b>Affiliation</b>
Kamal Garg	M	SEL
Gary Kobet	M	TVA
Tappan Manna	M	B&M
Pratap Mysore	M	Ulteig
Mukesh Nagpal	M	B&M
Ritwik Chowdhury	M	SEL
Steve Conrad	M	Retired PNM
David Cavelry	M	Trench
Bill Cook	M	Retired SDG&E
Robin Bayun	M	NASA
Nabil El Halabi	G	Aramco
Dean Miller	G	Consultant
Tim Condra	G	TVA
Seth Barnes	G	TVA
Genariel Hernandez	G	Quanta

**K35: Applying ground detection banks to ungrounded systems or systems that can become unintentionally ungrounded****Chair : Sebastien Billaut****Vice Chair : Ted Warren****Secretary: Koustubh Banerjee****Output: Technical report to the K Subcommittee****Established: 01/2024****Expected Completion Date: 05/2026****Assignment: Develop a summary paper for the updated C37.109 guide.**

The working group met in their first meeting Tuesday, May 14th, 2024; 09:20 AM – 10:30 AM EST in Buffalo, NY, with a total of 11 attendees in person. (4 members and 7 guests)

**Meeting Notes:**

- Agenda is presented.
- Discussion on the IEEE C37.234 bus guide and the need to add caveat regarding large capacitor unbalance and potential scenarios resulting in inadvertently ungrounded systems.
- A presentation of Slingshot 2.0 (initially Presented at the Texas A@M relay conference this past March 2024)
- New mathematical equations were presented to calculate resistor size by considering average capacitance and degree of capacitor unbalance.
- Questions and discussions on presentation – configuration of ground detection banks (PT) were discussed (grounded wye-grounded wye vs grounded wye – delta).
- Some discussions on unintentional grounded topology and methods to detect it have previously occurred in IEEE 1547.
- Incompatibility of broken delta configuration with generator management relay was discussed.
- Resistor sizing methodology in the bus guide was discussed.
- The working group is interested in solutions and study cases on unintentional grounding and in developing scenarios for the report.
- The scope of the report was discussed, and the ungrounded system's effect on the substation's transmission side will be focused on.
- Zero sequence voltage coordination between fault and ungrounded steady state conditions will not be excluded from the scope.
- The group discussed the need to consider different low-side substation feeder/breaker configurations and the need to trip the source for any unintentional ungrounded scenarios.
- The voltage slingshot effect on the feeder breaker was also discussed after tripping the source.

**Assignments:**

- Two attendees volunteered to put together an outline for the report (Daniel Lebeau and Robert James).

**Attendance:**

<b>Name</b>	<b>Membership</b>	<b>Affiliation</b>
Sebastien Billaut	Chair	Commonwealth Associates
Koustubh Banerjee	Secretary	Eversource Energy
Fredy Bravo	-	Duke Energy
Swagata Das	-	SEL
Amin Zamani	-	Quanta Tech
Robert James	-	PG&E
Steve Miller	-	Energy Emissions Intelligence
Paras Patel	-	TRC
Daniel Lebeau	-	Hydro -Quebec
Addis Kifle	-	Georgia Transmission Corp
Ajmal Saeed	-	PG&E

**Liaison Reports:**

T&D Committee, Capacitor Subcommittee, **Pratap Mysore,**

<http://grouper.ieee.org/groups/td/cap/>

Transformers Committee – PC57.135 Working Group, **Michael Thompson,**

<https://www.transformerscommittee.org/subcommittees/powertransf/>

**Old Business**

None

**New Business**

None

**Items of General Interest**

None

**Adjourn**

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**K Subcommittee Meeting Attendance**

<b>Name</b>	<b>Membership</b>	<b>Affiliation</b>
Adi Mulawarman (Chair)	Member	Xcel Energy
Brandon Davies (Vice Chair)	Member	TRC
Gene Henneberg	Member	NV Energy
Hillmon Ladner Garcia	Member	Southern Company
Jeff Barsch	Member	AEP
Kamal Garg	Member	SEL
Lubomir Sevov	Member	TRC
Michael Thompson	Member	SEL Engineering Services
Mukesh Nagpal	Member	Burns & McDonnell
Pratap G Mysore	Member	Pratap Consulting Services
Rick Gamble	Member	TVA
Satish Samineni	Member	SEL
Sebastien Billaut	Member	CAI-engineering
Stephen Conrad	Member	Retired
William English	Member	Consumers Energy
Alla Deronja	GUEST	ATC
Andy Kunze	GUEST	MN Power
Athula Rajapakle	GUEST	University of Manitoba
Bruce Mackie	GUEST	NAU
Daniel Khoroshansky	GUEST	Entrust Solutions Group
Ding Lin	GUEST	Manitoba Hydro
Farris Elhaj	GUEST	Burns & McDonnell
Joshua Hughes	GUEST	Qualus Corp
Juan Piñeros	GUEST	Colombia Power System Operator
Koustubh Banerjef	GUEST	Eversource Energy
Matt Garver	GUEST	Beckwith Electric
Matthew Leyba	GUEST	GE
Mike Basler	GUEST	Basler Electric
Paras Patel	GUEST	TRC COMPANIES INC
Seth Barnes	GUEST	TVA
Sudarshan Byreddy	GUEST	Burns and McDonnell
Tim Condra	GUEST	TVA



**Addendum B: PSRC May 2024 Meeting Agenda, Draft 8 (Final)**

ON SITE REVISIONS are marked in RED

WG / URL	Output	IEEE SA reference	MONDAY - MAY 13, 2024 (All times are Eastern Daylight Savings Time, EDT)	CHAIR	EST	Room
			<b>MONDAY - 8:00 AM - 9:10 AM</b>			
<a href="#">A3</a>	on-going		Newcomer Orientation - PSCCC	James Formea	20	Regency C
<a href="#">P5</a>	* Recd Practice		IEEE Std P1615 – Recommended Practice for Network Communication for Electric Power Substation Monitoring and Control	James Bougie	20	Regency B
H54	* Standard	C37.111	Revision of IEEE C37.111-2013/IEC 60255-24:2013 Standard for Common Format for Transient Data Exchange (COMTRADE) (DOUBLE SESSION 1 of 2)	Mark Adamiak	30	Grand Ballrm A
			<b>MONDAY - 9:20 AM - 10:30 AM</b>			
<a href="#">S8</a>	* Guide		WG: IEEE Std 2658 Guide for Cybersecurity Testing in Electric Power Systems	Nathan Wallace	20	Regency C
H54	* Standard	C37.111	Revision of IEEE C37.111-2013/IEC 60255-24:2013 Standard for Common Format for Transient Data Exchange (COMTRADE) (DOUBLE SESSION 2 of 2)	Mark Adamiak	30	Grand Ballrm A
			<b>MONDAY - 10:40 AM - 11:50 AM</b>			
<a href="#">S7</a>	* Standard		WG: IEEE Std 2808 Standard for Function Designations used in Electrical Power Systems for Cyber Services and Cybersecurity	Nathan Wallace	20	Regency C
<a href="#">S11</a>	Report	2024	Task Force on Roadmap Development for 50 Subcommittee	Dan Goodlett	20	Regency B
B1	On going		By Invitation - Awards and Technical Paper Recognition <b>CANCELLED</b>	Andre Uribe		<del>Regency A CANCELLED</del>
B4	On going		By Invitation - PSRC Long Range Planning	Murty Yalla		Grand Ballrm A
			<b>MONDAY - 11:50 AM - 1:00 PM LUNCH BREAK - on your own</b>			
			<b>MONDAY - 1:00 PM - 2:10 PM</b>			
<a href="#">S14</a>	Report		Study Group on HTTPS and TLS Exploration	Scott Lee	20	Regency C
H49	Report		Application considerations for the Use of Packet-Switched Communication Channels for pilot protection and teleprotection schemes	Steve Klecker	30	Grand Ballrm A
SCASC			IEEE Synchrophasor Conformity Assessment Steering Committee (SCASC)	Ken Martin		Regency A
			<b>MONDAY - 2:20 PM - 3:30 PM</b>			
A2TF	on-going		By Invitation - Fellows nominations JOINT WITH PSRC B2		10	Regency A
<a href="#">P14</a>	* Guide		WG: IEEE Std C37.236 – Guide for Power System Protective Relay Applications Over Digital Communication Channels	Tom Dahlin	20	Regency B
<a href="#">S10</a>	Report		TF: Utility & Municipality Challenges on Analyzing and Implementing Cybersecurity Standards and Best Practices	Jeff Pack	40	Regency C
B2	On going		By Invitation - Fellows Award - meets with PSCCC A2TF	T.W. Cease		Regency A
			<b>MONDAY - 3:40 PM - 4:50 PM</b>			
<a href="#">P21</a>	Report		SG: System architectures supporting the virtualization of substation protection and control applications -- JOINT WITH I49	Craig Preuss	20	Grand Ballrm A
B	On going		By invitation - PSRC SC Chairs meeting	Michael Thompson	15	Regency A
C23	On going		Coordination of Synchrophasor Related Activities	Yi Hu	20	Regency B
<a href="#">I49</a>	Report		Roadmap for developing new or updating existing IEEE standards to address issues of Centralized Protection and Control (CPC) Systems -- JOINT WITH P21	Craig Preuss / Brian Mugalian	30	Grand Ballrm A
			<b>MONDAY - 5:00 PM - 6:10 PM</b>			
<a href="#">C3TF</a>	Report		Task Force on Recent Experiences with Power Line Carrier for Protective Relaying	Craig Palmer	20	Regency C
I43	Report		EMP Resiliency	Angelo Tempone	30	Grand Ballrm A
			<b>MONDAY - 6:00 PM - 10:00 PM - RECEPTION and AWARDS DINNER</b>			
			Reception / Banquet / Awards	Andre Uribe	200	Grand Ballrm BCD

WG / URL	Output	IEEE SA reference	TUESDAY - MAY 14, 2024 (All times are Eastern Daylight Savings Time, EDT)	CHAIR	EST	Room
			<b>TUESDAY - 8:00 AM - 9:10 AM</b>			
<a href="#">PSCCC</a>			PSCC Working Group P&P / Standards Committee P&P Overview & Training	James Formea	30	Regency C
B3	On going		Membership - New Comers Orientation - PSRC	Mal Swanson		Niagara
C38	* Guide	2030.12	Design of Microgrid Protection Systems	S. S. (Mani) Venkata	60	Grand Ballrm A
C41	Report		Investigate performance requirements for Distribution PMUs	Ken Martin	20	Grand Ballrm F
D34			Coord w/ IEC 60255-187-3 Functional Spec for Line Current Diff Req <b>CANCELLED</b>	Normann Fischer	15	<del>Ellicot - CANCELLED</del>
D35	Report		Evaluation of Transmission Line Pilot Protection Schemes	Rick Gamble	50	Grand Ballrm B
D53			Report on distribution line protection practices survey	Muhammad Hamid	30	Regency A
H50	Report		Requirements for Time Sources in Protection & Control Systems	Dean Ouellette	30	Grand Ballrm E
ITF52	NA		Determine need for a corrigendum for IEEE Std C37.92-2023 and draft a PAR if there is a need	Eric Udren	20	Grand Ballrm G
J16	* Guide	C37.101	Revision of PC37.101, Guide for Generator Ground Protection - DOUBLE SESSION 1 of 2	Ryan Carlson	30	Grand Ballrm C
JTF28			Prepare J6, J14 papers for publication	Zeeky Bukhala	10	<del>Chippewa</del> Delaware
K12	* Guide	C37.431.20	Guide for Prot Static VAR Compensators Joint w/ Subst I9	Satish Samineni	20	Regency B
			<b>TUESDAY - 9:20 AM - 10:30 AM</b>			
<a href="#">P20</a>	* Standard		WG: Joint Work Revision of IEEE/IEC 61850-9-3-2016 – IEC/IEEE International Standard – Communication networks and systems for power utility automation – Part 9-3: Precision time protocol profile for power utility automation	Benton Vandiver	20	Regency B
<a href="#">S16</a>	Report		Study Group on Application of IDS and IPS to Electric Power Systems	Eugenio Carvalheira	20	Regency C
C51	Report		Investigate revising C37.117, Guide for the Application of Protective Relays Used for Abnormal Frequency Load Shedding and Restoration	Kevin Jones	30	Grand Ballrm F
DTF52			Investigating forming a Working Group on "Line Protection based on Transient Quantities" <b>CANCELLED</b>	Normann Fischer	30	<del>Regency A - CANCELLED</del>
H31	Report		Common Protection & Control parameters for COMSET	Depak Maragal	20	Grand Ballrm E
H40	* Recd Practice	C37.1.2	Databases Used in Utility Automation Systems	Theo Laughner	15	Ellicot
I46	* Guide	PC57.13.3	Review and determine need of revision of IEEE C57.13.3-2014 - IEEE Guide for Grounding of Instrument Transformer Secondary Circuits and Cases	Bruce Magruder	20	Grand Ballrm G
J16	* Guide	C37.101	Revision of PC37.101, Guide for Generator Ground Protection - DOUBLE SESSION 2 of 2	Ryan Carlson	30	Grand Ballrm C
J24	Report		Report on Synchronous Generator Disturbance Recording	Shane Haveron	10	Niagara
K31	* Guide	C37.119	Guide for Breaker Failure Protection of Power Circuit Breakers	Vahid Madani	35	Grand Ballrm B
K34	Summary Paper		Summary Paper for C37.109 Guide for the Protection of Shunt Reactors	Kamal Garg	20	Grand Ballrm A
K35	Report		Applying ground detection banks to ungrounded systems or systems that can become unintentionally ungrounded	Sebastien Billaut	20	<del>Chippewa</del> Delaware
			<b>TUESDAY - 10:40 AM - 11:50 AM</b>			
<a href="#">C1</a>	* Guide		IEEE-643 Guide for Power-Line Carrier Applications	Tony Bell	20	Regency B
<a href="#">S18</a>	* Standard		IEEE Standard Common Format for Documenting IED Firmware or Software Changes and confirming their transmittal (COMFIRM) [JOINT with PSRC I47]	Éric Thibodeau	20	Regency A
C29	Report		Power System Testing Methods for Power Swing Blocking and Out of Step Tripping	Kevin Jones	30	Regency C
D51	Report		Protection Consideration for Single Phase Tripping and Reclosing of Distribution Lines	Brian Boysen	35	Grand Ballrm F
H27	* Standard	C37.251	File format for IED configuration Data (COMSET)	Mario Capuozzo	30	Grand Ballrm C
I31	* Standard	P1613	Standard for Environmental and Testing Requirements for Devices with Communications Functions Used With Electric Power Apparatus	Brian Mugalian	10	Ellicot
<a href="#">I47</a>	* Rec. Practice	PC37.231	Review and determine need of revision of IEEE C37.231-2006 - IEEE Recommended Practice for Microprocessor-Based Protection Equipment Firmware Control. JOINT WITH PSCCC S18	Milton Quinteros	20	Regency A
J25	Report		Report on Synchronous Condenser Protection	Jason Eruneo	40	Grand Ballrm A
J26	Summary Paper		Summary Paper - Modeling of Generator Controls for Coordinating Generator Relays	Juan Gers	30	Grand Ballrm B
J27	Summary Paper		Summary Paper - Revision of PC37.106, Guide for Abnormal Frequency Protection for Generating Units	Bracy Nesbit	15	Niagara
K25	* Guide	C37.99	Guide for the Protection of Shunt Capacitors	Rick Gamble	30	Grand Ballrm G
			<b>TUESDAY - 11:50 AM - 1:00 PM LUNCH BREAK - on your own</b>			
L&L			LUNCH and LEARN SESSION: A Brief Introduction to AI and Machine Learning for Protective Relaying Engineers   Presentation by Theodore Hibka   (optional purchase, Includes Lunch)	Theodore Hibka	45	Grand Ballrm A

WG / URL	Output	IEEE SA reference	TUESDAY - MAY 14, 2024 (All times are Eastern Daylight Savings Time, EDT)	CHAIR	EST	Room
<b>TUESDAY - 1:00 PM - 2:10 PM</b>						
<a href="#">P19</a>	* Standard		WG: IEEE-P2030.103 - Standard for Universal Utility Data Exchange (UUDEX)	Scott Mix	20	Regency B
C48	Summary Paper		Summary paper of C37.120 Guide for Protection System Redundancy for Power System Reliability	Alla Deronja	20	Ellicot
CTF47			Relay Modeling in Electromechanical Dynamic Simulations for Power System Dynamic Performance (PSDP) committee	Evangelos Farantatos	20	Niagara
H30	Report		IEC 61850 User Feedback	Depak Maragal	35	Grand Ballrm C
H47	Report		Investigate Impact of Digital Comms on Prot & Control Applications	Mital Kanabar	30	Grand Ballrm G
HTF55	Report		Investigate Distributed Cyber Physical Assesment for Grid Resilience	Jeff Pack	20	Grand Ballrm E
I37	* Standard	PC37.90	Review of Standard for Relays and Relay Systems Associated with Electric Power Apparatus	Marilyn Ramirez	20	<del>Chippewa</del> Delaware
I48	* Guide	PC37.103	Revision of IEEE C37.103 Guide for Differential and Polarizing Relay Circuit Testing	Mohit Sharma	15	Regency A
J15	Report		Investigation of the criteria for the transfer of motor buses - DOUBLE SESSION 1 of 2	Wayne Hartmann	30	Grand Ballrm F
KTF33	Task Force		Explore need to amend C37.234 Bus Guide regarding stabilization of ungrounded bus with large or unbalanced shunt capacitance	Sebastien Billaut	20	Grand Ballrm B
<b>TUESDAY - 2:20 PM - 3:30 PM</b>						
<a href="#">C2</a>	* Standard		IEEE-C93.4 Standard for Power Line Carrier Line Tuning Equipment Associated with Power Transmission Lines	Dave McGuire	20	Regency B
<a href="#">S17</a>	Report		Task Force on Use of SBOM in the Energy Sector	Éric Thibodeau	20	Regency C
C45	Report		Protection and short-circuit modeling of systems with high penetration of inverter-based resources	Ali Hooshyar	60	Grand Ballrm A
CTF54			Investigate the need for a new standard or technical report to define the architecture and functional requirements of Protection, Automation, and Control (PAC) Systems for Data Centers including Electrical Power Monitoring System (EPMS) integration	Andre Melo	15	<del>Chippewa</del> Delaware
D37	Report		Report on Impact of Series Compensation on Transmission Line Protection	Mike Kockott	15	Ellicot
D54			Protection methods for non-effectively grounded distribution systems	Russ Patterson	20	Grand Ballrm E
DTF55			Protection of HVDC systems and dc distribution systems	Brandon Lewey	40	Regency A
H41	* Standard	1646	Communication Delivery Time Performance Requirements	Dave Dolezilek	15	Niagara
I4	On Going		International Standards Development (IEC Advisory)	Eric Udren	15	Grand Ballrm B
J15	Report		Investigation of the criteria for the transfer of motor buses - DOUBLE SESSION 2 of 2	Wayne Hartmann	30	Grand Ballrm F
KTF32	Task Force		Explore the need for a separate guide for protecting Harmonic Filter Banks	Satish Samineni	20	Grand Ballrm G
<b>TUESDAY - 3:40 PM - 4:50 PM</b>						
<a href="#">S1</a>	* Standard		WG: IEEE Std 1686 Standard for Intelligent Electronic Devices Cyber Security Capabilities	James Formea	20	Regency B
<a href="#">S15</a>	* Guide		IEEE Guide for Securing Generic Object Oriented System Events (GOOSE) and Sampled Values (SV) Protocols of IEC 61850 using IEC 62351-6 and IEC 62351-9	Jay Anderson	30	Regency C
C39	* Guide	C37.252	Guide for Testing Automatic Voltage Control Systems in Regional Power Grids <b>CANCELLED</b>	Xiaopeng Li	20	<del>Niagara</del> <b>CANCELLED</b>
C46	Transactions Paper		Draft a summary paper of C37.242: Guide for Synchronization, Calibration, Testing, and Installation of Phasor Measurement Units (PMUs) for Power System Protection and Control <b>CANCELLED</b>	Allen Goldstein	30	<del>Grand Ballrm G</del> <b>CANCELLED</b>
C52	* Guide		Revise standard C37.246 IEEE Guide for Protection System of Transmission-to-Generation Interconnections.	Melvin Moncey Joseph	40	Grand Ballrm B
D38	Report		Impact of High SIR on Line Relaying	Chris Walker	40	Grand Ballrm F
D45	Report		Protection methods used to reduce wildfire risks due to transmission and distribution lines.	Jon Sykes	40	Grand Ballrm A
H6	Summary Paper		Application Testing of IEC 61850 based Systems	Charlie Sufana	30	Grand Ballrm E
J30	Summary Paper		Summary Paper - Revision of PC37.102, Guide for AC Generator Protection	Steven Mueller	40	Grand Ballrm C
K29	Report		Reducing outage durations through improved protection and autorestitution in distribution substations	Sebastien Billaut	20	<del>Chippewa</del> Delaware
<b>TUESDAY - 5:00 PM - 6:30 PM</b>						
<a href="#">PSCCC</a>			Memberplanet Training Session <b>CANCELLED</b>	James Formea	30	<del>Regency C</del> <b>CANCELLED</b>
B	On going		By invitation - PSRC Advisory Committee	Michael Thompson		Regency A

WG / URL	Output	IEEE SA reference	WEDNESDAY - MAY 15, 2024 (All times are Eastern Daylight Savings Time, EDT)	CHAIR	EST	Room
<b>WEDNESDAY - 8:00 AM - 9:10 AM</b>						
<a href="#">P13</a>	Report		TF: Beginners guide to IEC 61850	Eugenio Carvalheira	30	Regency B
B11	On going		SC21 Distributed Resources Standard Coordination - OPEN TO ALL	Ben Kazimier	20	Niagara
C53	Report		Develop a Technical Report summarizing the collection, management, and analysis of protection & control data sets for artificial intelligence and machine learning applications	Dan Sabin	30	Grand Ballrm F C
D43	Report		Effect of Distribution Automation on Protective Relaying	Greg Ryan	30	Grand Ballrm E
D44	* Guide	C37.114	IEEE Guide for Determining Fault Location on AC Transmission and Distribution Lines	Sebastien Billaut	30	Grand Ballrm B
D47	* Guide	C37.243	IEEE Guide for Application of Digital Line Current Differential Relays Using Digital Communications	Alla Deronja	40	Grand Ballrm A
HTF56	Ongoing		H SC Ideation Meeting	Mital Kanabar	30	Grand Ballrm F
J22	* Guide	C37.96	Revision of PC37.96, Guide for AC Motor Protection DOUBLE SESSION 1 of 2	Zeeky Bukhala	30	Grand Ballrm G
<b>WEDNESDAY - 9:20 AM - 10:30 AM</b>						
C50	Report		Revise and expand PES-TR87 Protection of Wind Electric Plants to explicitly address other IBR plants (e.g., solar and battery energy storage)	Brandon Davies	30	Grand Ballrm F
D42	* Guide	C37.113	IEEE Guide for Protective Relay Applications to Transmission Lines	Jeff Barsch	50	Grand Ballrm A
H44	* Guide	C2030.101.1	Monitoring & Diag IEC 61850 GOOSE and Sampled Values Based Systems	Aaron Martin	40	Grand Ballrm C
H45	* Guide	C37.300	Guide for Centralized Protection & Control (CPC) Systems within a Substation	Ratan Das	40	Grand Ballrm B
H46	* Recd Practice	C37.1.3	HMI used in Substation Automation Systems	Matt Black	30	Grand Ballrm E
I45	Report		Grounding and Bonding Issues Associated With Substation Wiring Practices and Instrumentation	Adrian Zvorych	20	Regency A
I50	Paper		Develop a summary paper for IEEE Std C37.92 Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources	Eric Udren	20	Regency B
I51	Paper		Develop a summary paper for IEEE Std C37.110 Guide for the Application of Current Transformers for Protective Relaying Purposes	Juan Gers	20	Niagara
J22	* Guide	C37.96	Revision of PC37.96, Guide for AC Motor Protection DOUBLE SESSION 2 of 2	Zeeky Bukhala	30	Grand Ballrm G
<b>WEDNESDAY - 10:40 AM - 11:50 AM</b>						
<a href="#">C0</a>			Power Line Carrier Subcommittee	Tony Bell	50	Regency A
<a href="#">P10</a>	* Standard		WG: P2664 – Standard for Streaming Telemetry Transport Protocol	Ken Martin	20	Regency C
<a href="#">P16</a>	* Standard	P1854	WG: Joint Work and Review of IEEE Std 1854 Guide for Smart Distribution Applications JOINT WITH PSRC H53 <b>CANCELLED</b>	Xiangyu Ding / Craig Preuss	20	Regency B <b>CANCELLED</b>
B10	On going		By Invitation - Inverter Based Resources Steering Working Group	Michael Thompson	15	Niagara
C43	Report		Artificial Intelligence and Machine Learning technologies for power system protection and control applications	Yi Hu	50	Grand Ballrm A
D30	Tutorial		Tutorial on Application and Setting of Ground Distance Elements on Transmission Lines	Karl Zimmerman	30	Grand Ballrm B
D48	Report		Report on Single phase Trip and Reclose on Transmission Lines	Kamal Garg	30	Grand Ballrm E
H52	* Standard	C37.232	Common Format for Naming Time Sequence Data Files, C37.232, COMNAME	Ellery Blood	20	Grand Ballrm C
<a href="#">H53</a>	* Guide	P1854	Revision of IEEE Guide P1854 Use Guide for Smart Distribution Applications JOINT WITH PSCCC P16 <b>CANCELLED</b>	Xiangyu Ding	30	Regency B <b>CANCELLED</b>
I2	On Going		Terminology Usage Review	Mal Swanson	20	Grand Ballrm F
J21	Tutorial		Motor Protection Tutorial	Derrick Haas	30	Grand Ballrm G
<b>WEDNESDAY - 11:50 AM - 1:10 PM LUNCH BREAK - on your own</b>						
<b>WEDNESDAY - 1:10 PM - 2:35 PM</b>						
<a href="#">S0</a>			Cybersecurity Subcommittee	Scott Mix	50	Regency ABC
D. Line Protection Subcommittee				Meyer Kao	60	Grand Ballrm BCD
J. Rotating Machinery Subcommittee				Will English	40	Grand Ballrm A
<b>WEDNESDAY - 2:45 PM - 4:10 PM</b>						
<a href="#">P0</a>			Protocols and Architecture Subcommittee	Tom Dahlin	50	Regency ABC
C. Systems Protection Subcommittee				Michael Higginson	60	Grand Ballrm BCD
I. Protection and Control Practices Subcommittee				Ritwik Chowdhury	60	Grand Ballrm A
<b>WEDNESDAY - 4:20 PM - 5:45 PM</b>						
H. Relaying Communications and Control Subcommittee				Hugo Monterrubio	75	Grand Ballrm BCD
K. Substation Protection Subcommittee				Adi Mulawarman	50	Grand Ballrm A
WG / URL	Output	IEEE SA reference	THURSDAY - MAY 16, 2024 (All times are Eastern Daylight Savings Time, EDT)	CHAIR	EST	Room
<b>THURSDAY - 7:30 AM - 10:45 AM</b>						
PSRC MC			PSRC Main Committee	Michael Thompson	240	Grand Ballrm BCD <b>ABC</b>
<b>THURSDAY - 11:00 AM - 1:00 PM</b>						
<a href="#">PSCCC MC</a>			PSCCC Main Committee	James Formea	100	Grand Ballrm BCD <b>ABC</b>

Groups not meeting May 2024						
A1	on-going		Awards and Recognitions		10	no mtg 5-24
E0. Wire Line Subcommittee				John Fuller	50	no mtg 5-24
P1	* Standard		WG: IEEE PC37.238a – IEEE Draft Standard Profile for Use of IEEE 1588 Precision Time Protocol in Power System Applications Amendment 1: Adding a Type-Length-Value (TLV) to indicate the latest International Earth Rotation Service (IERS)-specified Universal Time Coordinated (UTC) Leap Second Event	Chris Huntley		no mtg 5-24
P2	* Standard		WG: IEEE Std 1815 – Standard for Electric Power Systems Communications-Distributed Network Protocol (DNP3)	Ronald Farquharson	20	no mtg 5-24
P3	* Standard		WG: IEEE 1815.1 – IEEE Standard for Exchanging Information Between Networks Implementing IEC 61850 and IEEE Std 1815(TM) [Distributed Network Protocol (DNP3)]	Ronald Farquharson	20	no mtg 5-24
P4			Update C37.115 Standard for Testing Communications in a Substation			no mtg 5-24
P6	Report		Application of Ethernet Networking Devices Used for Protection and Control Applications in Electric Power Substations	Eric A. Udren		no mtg 5-24
P7			Revision of Standard for N Times 64 Kilobit Per Second Optical Fiber			no mtg 5-24
P8	Report		TF: Recommended Mapping Approach between IEEE C37.118.2 and IEC 61850	Yi Hu		no mtg 5-24
P9	* Standard		WG: IEEE Std C37.118.2 – Standard for Synchrophasor Data Transfer for Power Systems	Vasudev Gharpure	30	no mtg 5-24
P11	Report		TF: Cloud Computing, uses and Requirements of Electric Power Utilities	T.W. Cease		no mtg 5-24
P12	Report		TF: Analog Leased Line End of Life and Migration	Marc Benou		no mtg 5-24
P15	* Standard		WG: P1815.2 – Standard Profile for Communications with Distributed Energy Resources (DERs) using IEEE Std 1815 [Distributed Network Protocol (DNP3)]	Eric Thibodeau	20	no mtg 5-24
P17			Investigate need for a guide for the architecture and tech specification of Cyber Physical Power Systems			no mtg 5-24
P18	* Guide		WG: Joint Working Group with SCC21 for revision of IEEE Std 2030. Guide for Smart Grid Interoperability of Energy Technology and Information Technology Operation with the Electric Power System (EPS), End-Use Applications, and Loads	Anthony Johnson	20	no mtg 5-24
SCC21			Standards Coordinating Committee 21 -- JOINT WITH P18	Anthony Johnson	20	no mtg 5-24
S2	* Standard		IEEE Std 1711.1 Standard for a Cryptographic Protocol for Cyber Security of Substation Serial Links: Substation Serial Protection Protocol (SSPP)	Mike Dood	20	no mtg 5-24
S3	* Standard		WG: IEEE Std 2030.102.1-2020 – IEEE Standard for Interoperability of Internet Protocol Security (IPsec) Utilized within Utility Control Systems			no mtg 5-24
S4	* Standard		IEEE Std 1711.2-2019 – IEEE Standard for Secure SCADA Communications Protocol (SSCP)			no mtg 5-24
S5	* Standard		WG: IEEE Std C37.240 – Standard Cybersecurity Requirements for Power System Automation, Protection and Control Systems	Steven Kunsman		no mtg 5-24
S9	Report		TF: Task Force on Utility IT-OT Cybersecurity Challenges in Roles and Terminology	Theo Laughner		no mtg 5-24
S13	* Guide		WG: Joint Work on IEEE Std 1547.3 Guide for Cybersecurity of DERs Interface with Electric Power Systems	Tony Johnson	30	no mtg 5-24
S19	Report		Review of DNP3 SAV6 and AMP	Andrew West		no mtg 5-24
B5	On going		Publicity	Cathy Dalton		no mtg 5-24
B8	On going		PSRC O&P Manuals Revision and WG Chair Training	Don Lukach		no mtg 5-24
B9	On going		PSRC Website	Rick Gamble		no mtg 5-24
C33	* Rec'd Prac	2004	HIL Simulation Testing Power Apparatus & Ctrl	Dean Ouellette	40	no mtg 5-24
C40	Tutorial		Prepare a tutorial from the work of C37.247 Standard for Phasor Data Concentrators	Vasudev Gharpure	10	no mtg 5-24
C44	Paper		Prepare a Summary Paper based on the Contents of the Report Prepared by the C24 WG "Modification of Commercial Fault Calculation Programs for Wind Turbine Generators"	Sukumar Brahma	30	no mtg 5-24
D29	Tutorial		Tutorial for Setting Impedance-Based Power Swing Relaying on Transmission Lines	Kevin Jones	30	no mtg 5-24
D50	Paper		Summary Paper for C37.104 Guide for Automatic Relclosing on AC Distribution and Transmission Lines	Manish Patel		no mtg 5-24
H17	Report		Establishing Links between COMTRADE, IEC 61850, and CIM	Christoph Brunner	20	no mtg 5-24
H22	* Guide	C37.249	Guide for Cyber Security for Protection Related Data Files	Amir Makki	20	no mtg 5-24
H51	* Standard	C37.239	COMFEDE Revision	Mark Admiak	15	no mtg 5-24
I32	Survey		A Survey of Protective System Test Practices	Andre Uribe	20	no mtg 5-24
I33	Report		Review of Relaying Testing Terms	Scott Cooper	10	no mtg 5-24
I36	* Standard	PC37.90.2	Revision of - Standard for Relays, Relay Systems, and Control Devices used for Protection and Control of Electric Power Apparatus – Radiated Electromagnetic Interference Withstand Capability Requirements and Tests	Chase Lockhart	20	no mtg 5-24
I40	* Standard	PC37.90.1	Standard for Relays, Relay Systems, and Control Devices used for Protection and Control of Electric Power Apparatus- Surge Withstand Capability (SWC) and Electrical Fast Transient (EFT) Requirements and Tests	Roger Whittaker	20	no mtg 5-24
I44	Report		Skills Required to Program, Commission, Test, and Maintain Ethernet Based PAC Systems	Andre Uribe	20	no mtg 5-24
J17	* Guide	C37.102	Revision of PC37.102, Guide for AC Generator Protection	Manish Das	40	no mtg 5-24
J20	Report		Report on Practices for generator synchronizing systems	Jason Eruneo	30	no mtg 5-24
J23	Report		Report on Generator Condition Monitoring	Steve Turner	20	no mtg 5-24
JTF29			J Subcommittee Scope Review			no mtg 5-24
K26	* Guide	C37.109	Guide for the Protection of Shunt Reactors	Kamal Garg	N/A	no mtg 5-24
K27	* Guide	C37.95	Guide for the Protective Relaying of Utility-Consumer Interconnections	Paul Elkin	30	no mtg 5-24

Power System Relaying and Control Committee  
PSRC Main Committee Meeting Agenda  
Thursday, May 16, 2024 7:30 AM - 10:45 AM (EDT)

- |       |  |                      |
|-------|--|----------------------|
| I.    | Call to Order/Introductions/Quorum   | Mike Thompson        |
| II.   | Approval of January 2024 Minutes/Financial Report  | Jim Niemira          |
| III.  | Reports of Interest  |                      |
|       | A. Technical Paper Coordination/Future Meetings  | Gene Henneberg       |
|       | B. CIGRE Report  | Mladen Kezunovic     |
|       | C. IEEE PES Report   | Mike Thompson        |
|       | D. IEC Report  | Eric Udren           |
|       | E. SC21 and 1547 Liaison Report  | Ben Kazimier         |
|       | F. Standard Coordinator's Report   | Don Lukach           |
|       | G. PSCC Committee Report   | Craig Palmer         |
|       | H. NERC Report   | Rich Bauer           |
|       | I. Renewable Systems Integration Coordinating Committee (RSICC)                                  | Kamal Garg           |
|       | J. Other Reports of Interest   | Mike Thompson        |
| IV.   | Advisory Committee Report  | Mike Thompson        |
|       | B1. Awards/Recognition   | Andre Uribe          |
| V.    | Subcommittee Reports   |                      |
|       | K - Substation Protection  | Adi Mulawarman       |
|       | J - Rotating Machinery   | Will English         |
|       | D - Line Protection  | Meyer Kao            |
|       | C - System Protection  | Michael Higginson    |
|       | I - Protection and Control Practices   | Ritwik Chowdhury     |
|       | H - Relay Communications   | Hugo Monterrubio     |
| VI.   | Presentations  | Jim Niemira          |
|       | C48 Summary paper of C37.120 Guide for Protection System Redundancy for Power System Reliability | Melvin Moncey Joseph |
| VII.  | Old Business   |                      |
| VIII. | New Business   |                      |
| IX.   | Announcements  |                      |
| X.    | Adjourn  |                      |