POWER SYSTEM RELAYING AND CONTROL COMMITTEE
of the IEEE POWER AND ENERGY SOCIETY
MINUTES of the MEETING in New Orleans, Louisiana, USA

January 8-11, 2024, In-Person Meeting held at Sheraton New Orleans Hotel
New Orleans, LA, USA

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

Chair Michael Thompson, called the Main Committee meeting to order at 7:30 AM (CDT) on Thursday, January 11, 2024.

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

Seven new Main Committee Members were recognized: Ryan Carlson, Louis Garavaglia, Kamal Garg, Steve Klecker, Bracy Nesbit, JC Theron, Adrian Zvarych.

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 60 Main Committee Voting Members present in person and 16 participating on line for total of 76 Main Committee Voting Members present, so quorum was achieved. Attendance at the meeting was recorded via in-person sign-in sheets and on-line participation in the Webex meeting. Attending this Main Committee meeting were 183 people both on line and in person; several were both in person and logged in on line and some additional Main Committee members joined the meeting after quorum check. Main Committee Meeting attendance breakdown is summarized in the following table:

Main Committee Meeting Attendance January 11, 2024	Voting Members	Guests	Total*
In person	69	61	130
On line	26	32	58
Total*	91	92	183
*Totals do not sum across or down because some participants were both in person and logged in on line.			

There were no objections or additions to the previously published meeting agenda. The final (Draft 7) meeting agenda is included in Addendum B of these Minutes.

Chair's Report - Michael Thompson

The January 2024 joint technical committee meeting (JTCM) was held at the Sheraton New Orleans, in New Orleans, LA. The IEEE PES PSRC Committee meeting was organized as a hybrid meeting (face-to-face and virtual) as has been our practice since emerging from the global pandemic. This approach of holding one meeting with a full virtual attendance option helps facilitate participation from our many diverse contributors. The hybrid format is a lot of work to pull off and we would not be able to do so without the JTCM taking on all responsibilities for organizing the hotel, catering, meeting space, AV, etc. We appreciate the JTCM organizers for making a hybrid format possible. And I appreciate all of the extra effort put in by the PSRC Committee and Subcommittee leaders, especially our secretary, Jim Niemira.

We are pleased to report that the overall attendance was strong with 300 attendees identifying as either PSRC or PSCC as their primary committee. We had greater than 70% participants attend in-person. OThe break down in participants at this meeting is shown below.

Committee	In person	On line	Total
PSCCC	34	10	44
PSRC	183	73	256
Total	218	83	300

In our efforts to improve the enrichment associated with our in-person meetings, I hope many of you took advantage of the tour hosted by Entergy of their Distribution Automation and Renewable Technologies (DART) Laboratory. I invite you to look forward to events we have planned for our May in-person meeting in Buffalo, NY. We will have our Monday evening welcome reception and awards banquet. We are also organizing a lunch and learn event, "A Brief Introduction to AI and Machine Learning for Protective Relaying Engineers" presented by expert, Theodore Hibka.

I know that we are all frustrated with the slow rollout of PES's membership management system, MemberPlanet. Without a GDPR compliant membertship management system, collaborating on our important work has been difficult. We hope that we will have news to share before our next meeting in May. In the meantime, I hope that you all continue to do the best you can to manage rosters and communicate to keep the work going.

Thank you to everyone for making our January 2024 meeting a success. I look forward to seeing you all in Buffalo, NY for our May meeting.

Sincerely

Michael Thompson

II. Approval of Minutes / Financial Report: Jim Niemira

Draft 3 of Minutes of the September 2023 PSRC in-person meeting held in Myrtle Beach, SC, were posted to the PSRC website for review. A motion to approve the Minutes of the September 2023 meeting as posted was made by Russel Patterson and seconded by Jonathan Sykes. The Motion to Approve May 2023 Minutes passed unanimously.

Total registration for both PSCCC and PSRC for the January 2024 is 218 in person and 83 on-line participants for total of 300 registrants. This compares to 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 JTCM were comparable to the last JTCM. PSRC receives no revenue from the JTCM. 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 PSCCC members Jim Formea, Craig Palmer, Jim Bougie, Eric Thibodeau for help with conference phones and setting up WebEx meetings.

Also thanks to the JTCM – Russ Patterson, Taylor Lineberger, Ashlee Clark, for the meeting arrangements, and to the A/V crew and Hotel Staff for their assistance and responsiveness.

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.

PSCC Committee supports hybrid format at all its meetings.

Many PES Technical Committees have returned to face-to-face for their committee wide meetings. PSRC Committee is returning to pre-pandemic format for two of three meetings per year, that is, May and September will be face-to-face meetings in person only.

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

Future PSRC meetings:

May 13-16, 2024, Buffalo, NY, (in person) Hyatt Regency Buffalo Hotel and Conference Center

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

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 still working on bug fixes. No short term use is anticipated.

As of September 2023, about half of Technical Committee participants have created MemberPlanet profiles. So far about 400 PSRC participants have created profiles.

PSRC Participants had been asked to create a profile in the IEEE PES CMS (Committee Management System) hosted by memberplanet by April 22, 2023.

If you haven't created your profile, please do so. It is required to update you on PSRC activities and 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

Committee Dashboard anticipated rollout was anticipated for mid-September 2023 (delayed from June) and has unfortunately hit further delays.

Dashboard and Tools will allow:

- View all committees or just your interest
- Members can view other committee members details in shared views
- Discussions allow posting new or adding to existing threads
- Complete view of all committee events including RSVP
- Documents allows administrators to upload files and post to members
- Announcements provides committee news
- Committee Admins controls administrative access
- Add members through IEEE search or excel file upload

We anticipate recording some Webex training when the system is available, so live meeting attendance won't be necessary.

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 to alert IEEE.
- You can find this link on the Knowledge Base page at the PSRC website pes-psrc.org.

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

PSRC has 5 Conference papers approved

PSRC has one 8-hour tutorial approved:

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

PSRC has 4 two-hour Panel sessions approved:

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

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

THE NEW ELECTRIC SYSTEM: REINVENTION AND RESILIENCE

10953-2024-GM-Flyer-Digital.pdf (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 requested 5 two-hour Panel Sessions:

- Improving Protection of Low-Voltage Networks with High DER – Matt 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 Elandaloussi, Yi Hu
- Protection Challenges in the Decarbonized and Resilient Power Grid – Yonghao Gui, Aleksander Dimitrovski

39 Papers submitted for PSRC review; 51 volunteer reviewers – THANK YOU!

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

reviews due by January 19, 2024

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-gridedge.org)

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

SC B5- Protection and Automation. The study committee met in Cairns, Australia on Sept 6, 2023 during CIGRE Cairns Symposium. General information about the SC activities may be found at their website: https://b5.cigre.org/.

- Each of the existing SC B5 WG gave an update on their activities: The active WGs and their TOR (SOW) are listed at: https://b5.cigre.org/GB/technical-activities/working-groups-list

- Three new WG were voted for further Technical Council coordination and approval (tentative titles):
    - PACS interfaced asset management and condition monitoring using innovative technologies
    - Recommendations and constraints for development and interfacing of virtual IED implemented in PACS
    - Protection, Control and Monitoring principles of synchronous condenser and generation with fly wheel
- Each WG has a placeholder for a US representative, so if someone is interested in participating and is a CIGRE member, let me know and I will coordinate with John McDonald, CIGRE USNC VP, Technical Activities, or contact John directly (John McDonald john@jdmassociatesllc.com)
- Preferential subjects for the next Paris meeting in 2024 are:
    - PS#1: Practical experiences and new developments of process bus
    - PS#2: Acceptance, commissioning, and field testing for protection, automation and control systems
- Recent Technical Reports:
    - B5.64 (To be published): Methods For Specification of Functional Requirements of Protection, Automation, and Control) is available for comment as attached.
    - B5.62 (TB 843): Life Cycle Testing of Synchrophasor Based Systems used for Protection, Monitoring and Control
    - B5.52 (TB 854): Analysis and comparison of fault location systems in AC power networks
- Next SCB5 Colloquium will be held in Osaka, Japan, June 30-July 6, 2024. The preferential subject are:
    - Interoperability of IEDs of different manufacturers and technologies integrated in one PACS
    - PACS Life Cycle Performance and Longevity
    - Experiences and possibilities on revised principles and policies related to modern protection IEDs
- Calendar of CIGRE Events in 2024 is posted at: https://www.cigre.org/GB/events/Calendar_gen.asp

Besides the events in Paris, the US National Committee is organizing a regular Grid of the Future conference. The last one was held Oct 9-12, 2023 in Kansas City, MO, 2022 in Chicago. The next one will be held Nov 11-14, 2024 in Raleigh, NC. The paper deadline will be posted soon. Further details are posted at: https://cigre-usnc.org/grid-of-the-future-2024/

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*

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

US Technical Advisory Group to USNC for TC 95

- 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 & admin 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.

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*
- ***27 Ed 3 AMD1 – CD with comments due 2/14***
  US reviewers already fixed early bugs
- 2024 Revision of - 60255-21-1,2,3 –
  merging into new standard 60255-21 – vibration, bump, shock, seismic req. - CD due any day now. Impacts product designers and 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 back 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 – first CD received with comments due on February 9. US TAG seeks review by users – is this a sound functional test draft, or does it need work? PSRC should form WG if our input and guidance is needed. Volunteers please!

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) with requirements – CD due in June.
- 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 loss, corrupt data bits, changes of latency, asymmetric latency, path interruptions and re-routing, and jitter or packet delay variation (PDV).
  - AHG meeting February 21, 2024 in FL with TC 95 Plenary.
- 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.
  - Prior COMTRADE versions were coordinated informally under the table.
- WG3 on Functional requirements for the protection of direct current (DC) transmission and distribution networks is underway.
  - Project plan by 2/24. Challenges in finding experts to work on it.

Other TC 95 News

- Next TC 95 Plenary Meeting – Florida F2F, Feb. 19-22, 2024
  - Maintenance Team (MT) standards work plus Thursday TC 95 Plenary.
- New TC 95 Chair
  - Murty Yalla's (6+3)-year term expires February 2024.
  - Successful term brought functional standards and overall progress.
  - New Chair – Andrea Bonetti of Sweden, experienced contributor.
  - We need NA focus on maintaining participation and relationship.
  - We need NA utility participants, and international utility participants.

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

IEEE P1547/.X Update – Liaison Report to IEEE PSRC – Sean Carr, P1547 WG Liaison to PSRC; Galina Antonova, P1547.10 WG Liaison to PSRC; Jens Boemer, SC21 Standards Coordinator; Benjamin Kazimier, PSRC B11 Chair

Approved Standards Projects - IEEE 1547 Series

- **IEEE P1547.2-2023 Application Guide to IEEE 1547-2018**
  - Guidance for application of IEEE 1547-2018 for all DER technologies.
  - Covers details for a wide variety of applications and technologies
- **IEEE P1547.3-2023: Guide for Cybersecurity of Distributed Energy Resources Interconnected with Electric Power Systems**
  - Guide for Cybersecurity of Distributed Energy Resources Interconnected with Electric Power Systems
- **IEEE 1547.9-2022: Guide for Energy Storage System Interconnection**
  - Interconnection of ES DER that are interfaced to an electric power system (EPS) via a power electronic interface (commonly referred to as a converter, inverter, or bidirectional inverter), capable of bidirectional active and reactive power flow, and capable of exporting active power to the EPS.
  - Guidance for non-exporting ES DER that could have power system impacts, e.g., modulating load proportionally to system frequency, such as some uninterruptible power supply (UPS) systems and electric vehicle (EV) chargers.

Approved Standards Projects - IEEE 2030 Series

- **IEEE P2030.4; Guide for Control and Automation Installations Applied to the Electric Power Infrastructure**
  - It provides guidance in applying the smart grid interoperability reference model (SGIRM) of IEEE Std 2030 in the development of control and automation components.
  - Outlines approaches to defining the requirements for control and automation applications within the electric power infrastructure, and describing their design, while adhering to a common open architecture.

- **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

Active Standards Projects – Other SC21 Projects

- **IEEE P2815 – Guide for the Technical Specification of Smart Distribution Transformer Terminal**
    - Provides a functional and technical specification of smart distribution transformer terminal (as a device) used in distribution network monitoring and operation.
    - Addresses various functions and requirements of the device, such as environmental conditions, power supply, communication and information exchange interfaces, hardware and software design, and application cases.
    - PAR Modification and Extension Approved by IEEE SA SB on12/6/2023

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

Future Standards Projects – IEEE 2030 Series

- **IEEE 2030.2-2015 - Guide for the Interoperability of Energy Storage Systems Integrated with the Electric Power Infrastructure**
    - Guidelines for discrete and hybrid energy storage systems that are integrated with the electric power infrastructure, including end-use applications and loads.
    - Builds upon IEEE Standard 2030-2011 Guide for Smart Grid Interoperability

Potential Standards Projects – IEEE 1547 Series (possible revisions)

- **IEEE 1547.7-2013: Guide to Conducting Distribution Impact Studies for Distributed Resource Interconnection**

- This guide describes criteria, scope, and extent for engineering studies of the impact on area electric power systems of a distributed resource or aggregate distributed resource interconnected to an area electric power distribution system
- **IEEE P1547.6-2011 (Inactive): Recommended Practice for Interconnecting Distributed Resources With Electric Power Systems Distribution Secondary Networks**
  - provides guidance for interconnection of distribution secondary network system types of area electric power systems (Area EPS) with distributed resources (DR) providing electric power generation in local electric power systems (Local EPS).

Let IEEE Staff or SC21 know if interested in participating in study group discussions

Key Updates for IEEE 1547-2018

IEEE 1547-2018 Rev WG Impacting IEEE PSRC

- **Approval of Formation of IEEE 1547-2018 WG Protection Task Force (TF3)**
- **Imminent Publication of IEEE 1547.2 Guide**
  - IEEE 1547.2 Guide contains significant protection recommendations related to IEEE 1547-2018
- **IEEE 1547 Scope Clarification**
  - Area EPS protection is clearly in-scope for the PSRC.
  - However, some of 1547's requirements impact Area EPS protection, and require coordination with other PSRC standards.
  - DER low-voltage ride through requirements (1547 clause 6.4.2) may interact with protection undervoltage elements (C37.230 clauses 5.3 and 6).
  - DER fault current characteristics (1547 clause 11.4) should consider the needs and operation of protection methods utilizing positive and negative-sequence current magnitudes and phase angles (C37.230 clauses 5.3.3 and 6).
  - DER grounding and DER transformers can have significant impacts on Area EPS ground fault detection.
  - Many of these issues were originally captured in PSRC D3 report "Impact of Distributed Resources on Distribution Relay Protection", August 2004 (https://www.pes-psrc.org/kb/report/082.pdf).
  - **Proposed solution: TF3**
    - ***There is a need for a small group dedicated to studying and addressing these interactions between 1547 requirements and Area EPS protection requirements.***
    - The role of TF3 is to make sure that DER performance requirements (coming from IEEE 1547) are coordinated/aligned as much as possible with Area EPS protection requirements (coming from PSRC).
    - Facilitator: Michael Jensen (PG&E)
    - Folder lead: Michael Ropp (Sandia National Laboratories)
    - PSRC B11 liaison: Sean Carr (ComEd)
    - Members: anyone interested in aspects of 1547 related to Area EPS protection.
  - **Protection Task Force TF3 Tasks**
    - 1. 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.
    - 2. Evaluate the interaction of DER fault current with Area EPS protection. Develop recommendations for fault current characteristic requirements for DERs. Coordinate with SG6.

- 3. Evaluate, and develop candidate text for, additional guidance on coordinating DER grounding and transformer configurations with Area EPS ground-fault protection. Coordinate with clause 4.12 (SG1?).
- 4. 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. *(Rationale: TF3 will, in the course of its work, is already developing a lot of material that would suit this purpose, so let's leverage it. Also, using the 2004 report gives useful structure and context to TF3's work.)*
- 5. Consider migration of certain language in 1547.2 to the base standard. Examples:
    - a. "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."
    - b. "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."
    - c. "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."
    - d. "When modeling inverters for protection studies, it is necessary to know both fault current magnitude and angle. The fault current angle is regulated by inverter controls and can have discernible impact on the fault current seen by utility relays. Therefore, both fault current magnitude and angle should be specified or modeled for protection studies."
    - e. "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."

Joint SC21/PSRC Standards Updates

IEEE P1547rev

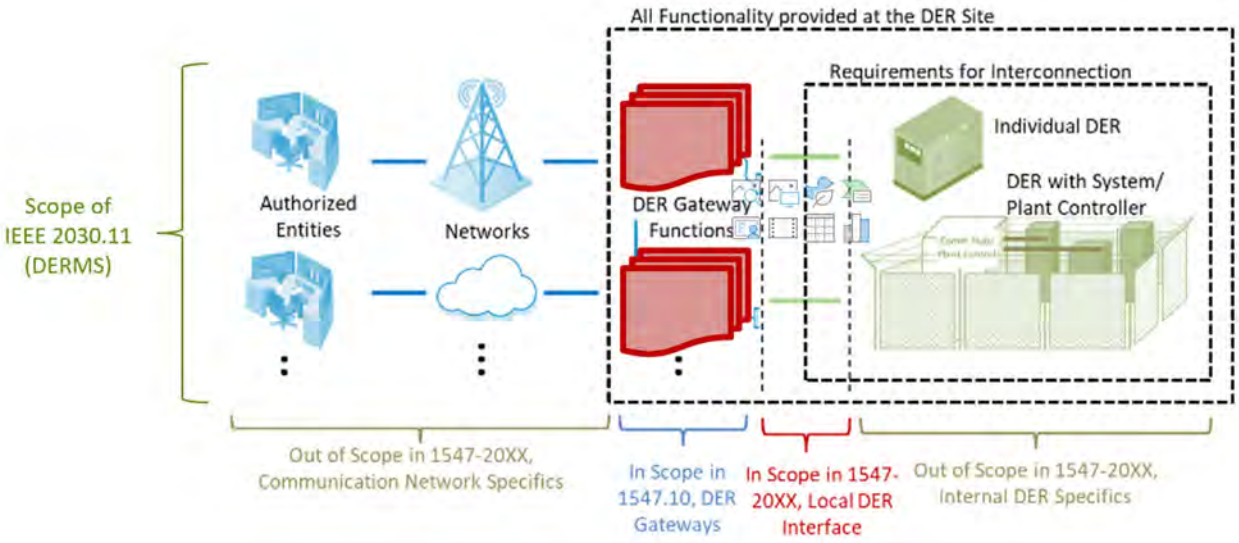
Joint Sponsors: COM/PLC, PE/EDPG, PE/PSCC, PE/PSRCC, PE/T&D, PE/EM, PEL/SC

IEEE P1547.10 (DER Gateways)

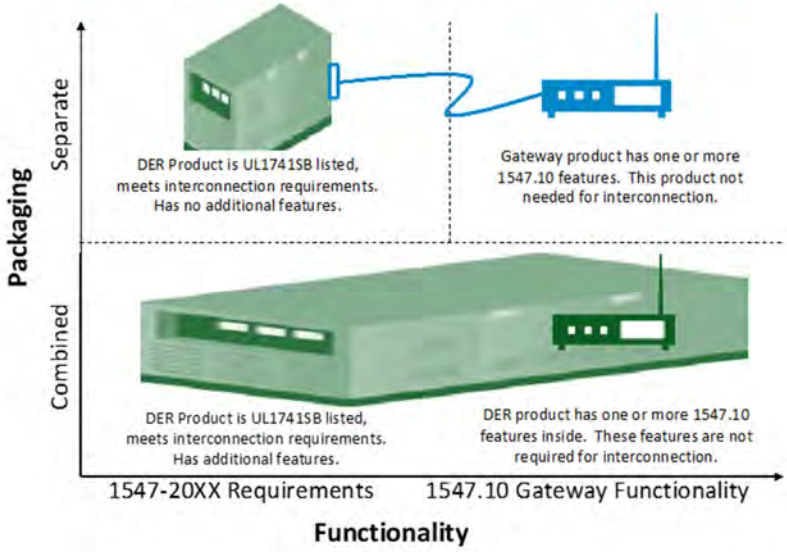
Joint Sponsors: COM/PLC, PE/EDPG, PE/PSCC, PE/PSRCC, PE/T&D

DER Gateway Functions: the 'missing link' between IEEE 1547 and IEEE 2030

"A DER Gateway is a set of advanced functions such as intelligence, monitoring, control, protocol translation and cybersecurity at the grid-edge, that augments IEEE 1547."



*DER Gateways are platforms that can use **stand-alone devices** and/or **hardware integrated into the DER**.*



Call to Action for IEEE PSRC Members

Upcoming IEEE 1547/.x WG Meetings- 2024

- 1st Full WG meeting – In-Person/ Virtual
  - Dates: January 9-10, 2024
  - IEEE JTCM New Orleans, LA
  - Joint WG Meetings (P1547 Rev)
- 1547.10 Jan/Feb 2024 TBD
- 2nd Full WG meeting in Andover, MA – Summer 2024 ? (Tentative)
  - To be hosted by Schneider Electric – Dan Sabin is POC (To be confirmed)
  - Proposed dates and time for future (full) WG meeting: identification of potential conflicts in Summer of 2024
  - Joint WG Meetings (P1547 Rev, P1547.10, P1547.4, P1547.1a, etc.)
- 3rd Full WG meeting in Atlanta, GA / Mid-West – Fall 2024 (Tentative)

- To be hosted by NERC / TBD – (To be confirmed)
- Proposed dates and time for future (full) WG meeting: identification of potential conflicts in Fall of 2024
- Joint WG Meetings (P1547 Rev, P1547.10, P1547.4, P1547.1a, etc.)

F. Standards Coordinator Report - Don Lukach

PSRC Standards (Standards, RPs, Guides)

65+ Standards
35+ Active PARs
1 Entity with PSRC Lead
6 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.
Several Standards completed, published, or will be published!
Multiple Standards with 2024 PARS.

Make a habit of checking MyBallot for ballots forming.

Check every two weeks or so to see if anything of interest is forming a ballot

Update on O&P Manual

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 28 active PARs that the PSRC leads, 8 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 January meeting 13 PARs will expire at the end of 2024. Nine of fourteen are in the ballot stage.

Mandatory SA training for all applicable PSRC members continues. IEEE SA provides the notifications and tracking of all affected individuals.

Completed PAR projects in 2023*:*

Project	Title	Chair	V Chair	WG	Status
PC37.92	Standard for Analog Inputs to Protective Relays From Electronic Voltage and Current Transducers	Ritwik Chowdhury	Eric Udren	I38	SASB Approval 15FEB23 Published April 23
PC37.110	Guide for the Application of Current Transformers Used for	Joseph Valenzula	Michael Higginson	I29	SASB Approval 15FEB23 Published 24MAY23

	Protective Relaying Purposes				
PC37.233	Guide for Power System Protection Testing	Don Ware	Matt Black	C26	SASB Approval 5JUN23 Published 7SEP23
PC37.90.3	Standard Electrostatic Discharge Tests for Protective Relays	Steve Turner	Dan Ransom	I41	SASB Approval 29JUN23 Published 5SEP23
P1613	Standard for Environmental and Testing Requirements for Devices with Communications Functions used with Electric Power Apparatus	Brian Mugalian	Craig Preuss	I31	SASB Approval 21SEP23 Published TBD (In Process 12/8/23)
PC37.109	Guide for the Protection of Shunt Reactors	Kamal Garg	Ilia Voloh	K26	SASB Approval 6DEC23 Published TBD (In Process 12/21/23)
PC37.102	Guide for AC Generator Protection	Manish Das	Gary Kobet	J17	SASB Approval 6DEC23 Published TBD (In Process 12/7/23)

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

For the current status refer to MyProject.

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

- **Mandatory Training** - Understanding IEEE SA's Antitrust, Competition, and Commercial Terms Policies training Officers
  - needs to be completed by IEEE SA Standards Committee and WG officers
  - *Completion was due by 31 December 2023.
- IEEE SA Standards Committees and Working Groups are required to maintain rosters
  - myProject can be used to maintain WG rosters; staff is reaching out to Standards Committees and Working Groups to assist in uploading rosters to myProject
- Financial Report Submission obligations
  - The 2023 IEEE Standards Association Financial Report is Due by 15 February 2024 by 5pm EST to safinance@ieee.org
  - All Standards Committees and Working Groups must complete the report, even if they do not have financial activity.
- 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
  - NOTE: All approved updates to IEEE SA policies and procedures are expected to be published early 2024, your PMs will provide details once they are available

G. PSCCC Committee Report to PSRC – Craig Palmer, Secretary PSCCC:
PSCCC was indicated as PRIMARY Committee for 34 in person attendees and 10 on line. In addition, 144 indicated PSCCC as non-primary committee.
PSCCC held 24 WG meetings and 4 SC meetings
Refer to PSCCC Minutes (available on the PSCCC website)for complete details of PSCCC meetings.
Thanks to PSRC officers & committee members for their support of & contributions to PSCCC!

H. NERC Report: Rich Bauer
No report

I. Renewable Systems Integration Coordinating Committee (RSICC) Update -Kamal Garg
Nothing to report

J. Other Reports of Interest
Fellows Class of 2024

- PES had a banner year with 40 PES members elevated
- The relaying community had 6 elevated
- Gabriel Benmouyal- for contributions to digital protective relays for power systems
- Robert Cummings- for leadership in power system disturbance analysis and standardization of power system protection and reliability
- Normann Fischer- for contributions to fault protection methodologies for electric power grids

- Herbert Falk- for contributions and leadership in secure, reliable, and interoperable communication of the electric power grid
- Gene Henneberg- for contributions to electric power system integrity protection schemes
- Michael Ropp- for contributions to distributed energy resources integration in power systems

IV. Advisory Committee Reports: - Michael Thompson

B1: <u>Awards and Technical Paper Recognition Working Group</u>

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
- Alla Deronja
- Mital Kanabar
- Angelo Tempone
- Will English
- Brandon Davies
- Don Lukach
- Brian Mugalian

Next PSRC/PSCC Awards Ceremony will be held in:
Buffalo, NY
Monday May 13, 2024
Hyatt Regency Buffalo Hotel
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:
   The Hyatt Buffalo Regency Hotel
   Two Fountain Plaza
   Buffalo, New York, United States, 14202
6. Correspondence: 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 - January 11, 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 January 11 meeting was 256, consisting of 183 in-person and 72 on-line. This is one our best attendances for a hybrid meeting...

11 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.

One management support letter was 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: Mal Swanson
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.

We will experiment with social media, namely LinkedIn, for the May 2024 PSRC meeting in Buffalo. A suggestion was made to advertise the meeting a month in advance on the LI website among our connections, ask people (current connections, PSRC members, etc. to like it, and request them to repost it. Cathy will socialize this idea among the subcommittee chairs , since some of them are not on LinkedIn. We continue to provide quarterly PSRC updates to PACWorld magazine. Suggestion that outgoing chairs (every two years) provide input for the update for each December issue, by end of November. Goal of their input is to provide a message to the world regarding their perspective and value received from being a part of PSRC over time. In addition, a suggestion for Cathy to include a quote or two from newcomers, which describes the value they achieved/received at their first meeting or two. Another suggestion from Mal (at a past meeting) is to publicize, among PSRC members only, all the technical papers that are presented at various regional conferences such as Georgia Tech, WPRC, and Texas A&M protective relay conferences. This will be an encouragement to PSRC members to

continue to contribute to working groups, to encourage technical presentations, and to show how active PSRC members are with sharing their technical and industry knowledge. We need to discuss how to gather this information, since obtaining agendas is difficult.

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.
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: January 10, 2024
Meeting Participants:

Name	Affiliation	Voting Status (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
Jens Boemer	EPRI & NREL/DOE	Voting Member
Chip Christmann	Basler Electric	Participant
Nuwan Perera	Power Engineers	Participant
Seth Nelson	Basler	Participant
Eric Thibodeau	Hydro-Quebec	Participant
Charlie Sufana	Retired	Voting Member
Mike Thompson	SEL Engineering Serv.	Participant

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 @ 9:15AM EST

Date, time, and location of next meeting: May 2024, Buffalo, NY

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.

Topics discussed:

- Had some AV problems at start of meeting.
- Introductions were made.
- Galina Antonova gave an update on 1547.10.
    - 1547.10 is DER Gateway Standard
    - They have been discussing the scope of the document.
    - Next meeting will happen in the spring 2024 to continue discussions.
    - There is some interest in doing a utility survey on what functionalities may be missing from the standard so they can be identified and addressed.
- Wayne Stec gave update on other 1547 standards.
    - 1547.2 & 1547.3 have been approved for publication.
    - 1547.9 was published in 2023.
    - 1547.18 is meant to be a quick update standard.
    - 1547.1a is meant to be a reconciliation of identified changes needed to be made to the 1547.1 standard.
    - 1547 2018 Task Force 3 (TF3) is being formed and led by Mike Jensen of PG&E
    - TF3 is focused on Area EPS requirements and finding a balance between the Bulk Power system and EPS requirements.
    - TF3 is attempting to address the need for coordination between the PSRC and the 1547 standards to ensure EPS protection requirements are adequately met.
    - P2815 update was given.
    - Upcoming 1547 meeting dates were discussed.
        - 1st meeting was at JTCM in New Orleans Jan 2024
        - 2nd meeting will be in Andover, MA in summer of 2024
        - 3rd meeting will be in Atlanta, GA in fall of 2024
- PSRC should have a vested interest in 1547.7.
- C41 working group would like some help/input on DER field measurement data. They have not been able to get any. – Talk to Sean Carr. He could be a good resource.

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 H, I, J, K. C, D)

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 January 10, 2024, and attained quorum; attendance figures will be in the C SC Minutes
No new members at this meeting
Tony Seegers has asked to be made a guest. Thank you for your contributions to C SC, Tony!

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
Ballot comments resolved, expecting to recirculate shortly

C39: C37.252 Guide for Testing Automatic Voltage Control Systems in Regional Power Grids
PAR extended through 2025
Presently re-balloting, expected to complete before next PSRC meeting

CTF51: C37.117 Guide for the Application of Protective Relays Used for Abnormal Frequency Load Shedding and Restoration
Task Force decided to create a report
Subcommittee formed a Working Group at this meeting

C52: C37.246 Guide for Protection Systems of Transmission-to-Generation Interconnections
PAR approved by subcommittee at this meeting

C43 Revised Assignment

New 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.

CTF-54: New Task Force

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.
Chair: André Melo

"D" Subcommittee Report – Line Protection

Chair: Meyer Kao
Vice Chair: Alla Deronja
Refer to D SC Minutes for complete report.
Met on January 10, 2024, 4:20 PM CST
15 Active Working Groups and 3 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-SUB WORKING GROUPS On Going and Making Good Progress

D29: Tutorial for Setting Impedance-Based Power Swing Relaying on Transmission Lines
Chair: Kevin Jones, Vice-Chair: N. Fischer

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

D37: Report on Impact of Series Compensation on Transmission Line Protection
Chair: Mike Kockott, Vice-Chair: N. Perera, Sect.: M. Moncey Joseph

D38: Impact of High SIR on Line Relaying
Chair: Chris Walker, Vice-Chair: G. Ryan

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

D45: Protection Methods to Reduce Wildfire Risks due to Transmission and Distribution Lines
Chair: Jonathan Sykes, Vice-Chair: S. Hayes

D47: Revise C37.243, IEEE Guide for Application of Digital Line Current Differential Relays Using Digital Communications
Chair: Alla Deronja, Vice-Chair: S. Klecker, Sect.: A. Antonova

D48: Create Report on Single phase Trip and Reclose on Transmission Lines
Chair: Kamal Garg, Vice-Chair: I. Voloh

D51: Protection Consideration for Single Phase Tripping and Reclosing of Distribution Lines
Chair: Brian Boysen, Vice-Chair: J. Jester

D53: Report on distribution line protection practices survey
Chair: Muhammad Hamid, Vice-Chair: G. Ryan, Sect.: B. Boysen

D48: Create Report on Single phase Trip and Reclose on Transmission Lines
Chair: Kamal Garg, Vice-Chair: I. Voloh

D51: Protection Consideration for Single Phase Tripping and Reclosing of Distribution Lines
Chair: Brian Boysen, Vice-Chair: J. Jester

D-SUB TASK FORCE

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

DTF54: Evaluate creation of a report on protection methods utilized on compensated neutral grounded distribution systems
Chair: Russ Patterson

DTF55: Protection of HVDC systems and dc distribution systems
Chair: Brandon Lewey

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 ¾ approval criteria
- Resolving D-Sub balloting comments

D35: Evaluation of Transmission Line Pilot Protection Schemes
Chair: Rick Gamble, Vice-Chair: Brandon Lewey
- Paper ready and will be sent out for D-Subcommittee balloting

D43: Update PSRC Report, Effect of Distribution Automation on Protective Relaying
Chair: G. Ryan, Vice-Chair: A. Zamani, Secretary: J. Hughes

– Paper ready and will be sent out for D-Subcommittee balloting

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

– D-Subcommittee voted to D44 WG to submit Draft 3.1.2 of C37.114, IEEE Guide for Determining Fault Location on AC Transmission and Distribution Lines, to IEEE-SA for Sponsor ballot

D50: Create Summary Report on C37.104 IEEE Guide for Automatic Reclosing for AC Distribution and Transmission Lines

Chair: M. Patel, Vice-Chair: J. Lamb; Secretary: M. Rios

- Has completed its assignment
- Presentation at PSRC Main Committee

New Working Group

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

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

Chair: Russ Patterson; Vice Chair: TBD; Secretary: TBD

"H" Subcommittee Report – Relaying Communications and Control

Chair: Hugo Monterrubio
Vice Chair: Mital Kanabar
Refer to H SC Minutes for complete report.

H SC met January 10, 2024, with 32 Members (25 in person + 7 remote) and 17 Non-members. Quorum was established.

HSC currently has 18 active Working Groups (WGs) and one TF.
11 WGs are working on IEEE Standards and 7 are generating Technical Reports. With 8 WG's (5 Standards and 3 reports) abut to complete their work this year or early next, the H SC will start a TF this coming May to organize ideation sessions to brainstorm and collect ideas around the scope of the H SC for future TF's or WG's.

WG H17 Completed Technical Report Establishing Links between COMTRADE, IEC 61850, and CIM The WG has completed addressing all comments received in Spring of 2021. The WG will recirculate the report one more time before May to request a final approval and complete their work this year. Chair: Christoph Brunner in 2021.

WG H22 PC37.249 Guide for Categorizing Security Needs for Protection Related Data Files is in final comment resolution in SA. The WG will be completing their work this year. HSC Chair: Amir Makki

WG H27 PC37.251: Standard for Common Protection and Control Settings or Configuration Data Format (COMSET). Their ballot period closed with 19 comments. The WG is addressing these comments and expects to complete their work this year. Chair: Mario Capuozzo

WG H40 C37.1.2 :, Databases Used in Utility Automation Systems. Ballot group has been formed, due January 21st. The WG will use the May meeting to resolve comments and they expect to complete their work this year. Chair: Theo Laughner

WG H44 C2030.101.1 :, Monitoring & Diag IEC 61850 GOOSE and Sampled Values Based Systems. Currently working on Draft 6.0 which will be circulated in May. Their PAR expires at the end of this year so the WG will be requesting a PAR extension to be able to complete their work. Chair: Aaron Martin

WG H22 PC37.249 Guide for Categorizing Security Needs for Protection Related Data Files is in final comment resolution in SA. The WG will be completing their work this year. HSC Chair: Amir Makki

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"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, January 10, 2024, with 29 members— quorum was established. Complete attendance will be in the minutes.

Two new members for a total of 39 Voting Members
Approved I SC Minutes from September 2023
Presently 20 WG/TF (1 new)

WG updates of note:

I2 – Terminology Review

Now also reviewing terms for non-PAR outputs (e.g., reports, summary papers). If you are writing a report, send your terms to Mal and Claire for editorial review.

I26 – Report on Mathematical Models of Current, Voltage, and Coupling Capacitive Voltage Transformers

Published report now available on PSRC Knowledge Base and PES Resource Center.

I44 – Report on skill sets required by relay test technicians for setting, commissioning, and testing relay systems, given new technologies such as IEC 61850

WG approved draft ready. SC Ballot being initiated.

I32 – Survey relay test practices

Working group finalizing the draft. Will send out for review summer 2024.

I31, I36, I37, I40 - C37.90.x and 1613

1613 RevCom approved. Resolving IEEE editorial comments.
C37.90 obtained approval from SC to initiate IEEE-SA Ballot. Will start balloting soon.
C37.90.1 Initial IEEE-SA ballot complete. CRG formed and resolving 188 comments.
C37.90.2 resolved ballot comments and is initiating recirculation, then off to RevCom approval.

I50 – Summary Paper for IEEE Std C37.92-2023 Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources.

ITF52 – Evaluate need for a corrigendum.

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.

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 and drafting this new standard.

I33 – *Report on Review of Relay Testing Terms*
Another round of recirculation being initiated for the minor comments received from the previous round.

I48 – *Review and revise C37.103-2015 – IEEE Guide for Differential and Polarizing Relay Circuit Testing.*
Draft is being developed, work progressing well via virtual meetings.

I45 – *Investigation of Grounding and Bonding Issues Associated with Substation Wiring Practices and Instrumentation*
Continuing to refine report and place in PES template format. Plan to go to SC Ballot summer of this year.

ITF51 – *Evaluate interest in Summary Paper for IEEE Std C37.110*
Working group I51 formed considering interest.

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.*
Revisions to certain sections, working progressing well.

OTHER TOPICS

Liaison Reports:
Johnny Moore reported on PSIM.
Angelo Tempone monitoring Entity Standard P3416 Guide for Test Sets and Tools for Testing Protective Relays
Transformers Committee—need new liaison now that Will Knapek has retired.

See I SC meeting minutes.

"J" Subcommittee Report – Rotating Machinery

Chair: Will English
Vice Chair: Jason Eruneo
Refer to J SC Minutes for complete report.
J SC met Wednesday, January 10, 2024, with 20 members present – quorum was met

J6/JTF28 Protection Issues Related to Pumped Storage Hydro Units – Pending verification by SC Chair, report will be sent to MC Officers
J15 Investigation of the Criteria for Motor Bus Transfer – Resolving WG ballot comments
J20 Practices for Generator Synchronizing Systems – will be sent to MC officers
J25 Synchronous condenser protection (report) – Still some disagreement with EMC on whether SC needs out-of-step protection

Three PAR activities:
J16 Revise C37.101 Generator ground protection: WG balloted; PAR closes 2024
J17 Revise C37.102 AC generator protection: RevCOM approved 12/5/2023
J22 Revise C37.96 Motor protection: Work started, still need figures from earlier document; PAR closes 2025

"K" Subcommittee Report – Substation Protection

Chair: Adi Mulawarman
Vice Chair: Brandon Davies
Refer to K SC Minutes for complete report.
Met January 10, 2024. Quorum Met – 16 of 29 members present

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

K12/Sub I9 – Static Shunt Compensators
K25 – Shunt Capacitors
K26 – Shunt Reactors
K27 – Utility-Consumer Interconnections
K29 – Reducing outage durations
K31 – Breaker Failure
TF32 –Investigate on the need for creating protection guide for filter banks.
TF33 –Investigate on need for clarification of ungrounded bus protection from bus protection guide
K34 – Summary paper of Shunt Reactor Guide

New working group **K35** formed with assignment:
Write a comprehensive report on applying ground detection banks to ungrounded systems or systems that can become unintentionally ungrounded
Chair: Sebastien Billaut

VI. Presentations to the Main Committee:

PRESENTATION – Summary Paper for IEEE C37.104 **Guide for Automatic Reclosing on AC Distribution & Transmission Lines** – Manish Patel, Southern Company Services

Presentation – 1547.2-2023 **Guide for Application of IEEE Std 1547-2018™ IEEE Standard for Interconnection & Interoperability of DER with Associated Electric Power Systems Interfaces** – Wayne Stec, Distregen

VII. Old Business:

No Old Business

VIII. New Business:

No New Business

IX. Announcements:

Next meeting will be In Person format at the Hyatt Regency Buffalo, NY. 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 Andre Uribe; second by Pratap Mysore.
Meeting adjourned 10:43 AM CST.

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 January 2024 Meeting Agenda, Draft 7 (Final)

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

System Protection "C" Subcommittee of the PSRC
January 10, 2024 Minutes

Chair: Michael Higginson Michael.Higginson@sandc.com
Vice Chair: Manish Patel mpatel@southernco.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 January 10, 2024 at 1:10 PM Central Time. Members and guests in presence introduced themselves and indicated their affiliations. A quorum was achieved (30 out of 53 members and 52 guests).

The Subcommittee reviewed the agenda. Chris Walker made a motion to approve the agenda, Alla Deronja seconded, and the agenda was approved with no opposition.

The September 2023 minutes were reviewed. Jonathan Sykes made a motion to approve the minutes, Ritwik Chowdhury seconded, and the minutes were approved with no opposition.

Advisory Committee Items of Interest
- Prices at future meetings are likely to increase.
- Please register for meetings early. Late registrations are challenging to manage.
- PSRC's Policies and Procedures for Working Groups clause 6.4 requires that meeting minutes for Subcommittee (SC), Working Group (WG), and Task Force (TF) 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 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, January 19, 2024. Please use the provided Word template and include your assignment.
- Let us know if you are interested in serving as a co-webmaster to help and work with Rick Gamble.
- 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.
- 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.
- Registration for this PSRC meeting was about 256 people, with 183 in person registrants.
- 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.
- 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.pes-psrc.org/knowledgebase.
- 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.
- Malia Zaman has offered to help update WG rosters in MyProject for PAR related WGs. Please reach out to Malia with any questions.
- The Awards Ceremony will take place during the Monday night reception for May and September meetings. Please consider this when making your travel plans.
- WG officers should request certificates for their members upon completion of their work. Andre Uribe can address any open questions.
- 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
Since the September 2023 meeting, the C39 WG (IEEE C37.252 Guide for Testing Automatic Voltage Control Systems in Regional Power Grids) has satisfactorily addressed all comments received from the C-SC members. With satisfactory resolution of comments, the C-SC approves starting of IEEE-SA ballot for IEEE C37.252. Mike Higginson communicated this to C39 WG leadership on November 4, 2023.

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. Malia Zaman noted 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. Ken Martin suggested to discuss further with Vasudev Gharpure, who might be interested in leading this work.

André Melo suggested to create a task force to study 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. Some questions raised were as follows:

1. Does the scope include only utility owned infrastructure serving data centers or infrastructure within data center be also in the scope?
2. Would there be enough participants?
3. Would on-site generation be in scope?
4. Is standardization possible given there is not much information available publicly?

Upon conclusion of discussion, a new task force was created to further ponder these questions and to recommend a course of action to the subcommittee. André Melo will chair the new TF.

In September 2023, the C43 WG published a technical report, PES-TR112, titled Practical Applications of Artificial Intelligence and Machine Learning in Power System Protection and Control.

Given the topic is evolving fast, the WG recommends revision of this technical report. Yi Hu made a motion to update the C43 WG's assignment to revise the report on Practical Applications of Artificial Intelligence and Machine Learning in Power System Protection and Control to include latest industry advancements and findings. Gene Henneberg seconded, and the motion was approved with no opposition.

The CTF51 recommended to create a working group that would develop an IEEE PES technical report on underfrequency excursion mitigation strategies for changing generation resource mixes in the bulk power system. Kevin Jones moved to form a WG that would develop an IEEE PES technical report on underfrequency excursion mitigation strategies for changing generation resource mixes in the bulk power system, Ritwik Chowdhury seconded, and the motion was approved with no opposition. The new WG C51 will be chaired by Kevin Jones. Chase Lockhart will serve as a vice-chair/secretary. The WG assignment is to prepare a technical report on underfrequency excursion mitigation strategies for changing generation resource mixes in the bulk power system.

The C52 WG developed a PAR to revise the C37.246 IEEE Guide for Protection Systems of Transmission-to-Generation Interconnections. Ritwik Chowdhury moved to submit a PAR to Revise IEEE Guide C37.246, IEEE Guide for Protection Systems of Transmission-to-Generation Interconnections, with the following Scope, and Purpose. Nuwan Perera seconded, and the motion was approved with no opposition.

> **Proposed Scope:** This guide documents accepted protection practices for transmission-to-generation interconnections. It is intended to cover the protection system applications at the interconnections between transmission systems and generation facilities ~~greater than 10 MVA~~. This guide ~~does not cover distributed energy resources~~ also applies to transmission-interconnected energy storage facilities. It does not cover distribution-interconnected energy resources but may apply to sub-transmission-interconnected energy resources.
>
> **Proposed Purpose:** This guide provides guidance to those who are responsible for the protection of electrical interconnections between transmission systems and generation or energy storage facilities ~~greater than 10 MVA~~. It is not intended to supplant specific ~~transmission or generator~~ asset owner practices, procedures, requirements, or any contractual agreement between the ~~transmission and generator~~ asset owners.

General Discussion
None

Adjourned
The subcommittee meeting adjourned at 2:30 PM Central Time. Mani Venkata moved to adjourn, Ritwik Chowdhury seconded.

Subcommittee Meeting Attendees

Name	Member/Guest	Affiliation
Ritwik Chowdhury	Voting Member	SEL
Alla Deronja	Voting Member	American Transmission Company

Miguel Rios	Voting Member	Southern Company
Melvin Moncey Joseph	Voting Member	Black & Veatch
Muhammad Faisal Hamid	Guest	Black & Veatch
Andre Melo	Guest	Schneider Electric
Michael Kockott	Voting Member	Hitachi ABB Power Grids
Nuwan Perera	Voting Member	Power Engineers
Dinesh Gurusinghe	Voting Member	RTDS Technologies Inc.
Michael Meisinger	Voting Member	S&C Electric
Mat Garver	Guest	Beckwith Electric Co. Inc.
Chase Lockhart	Guest	1898 & Company
Amin Zamani	Voting Member	GE Renewable Energy
Yi Hu	Voting Member	Quanta Technology, LLC
Todd Martin	Guest	Basler Electric
Sukumar Brahma	Voting Member	Clemson University
Kamal Garg	Voting Member	Schweitzer Engineering Laboratories, Inc.
Jonathan Sykes	Voting Member	Quanta Technology
Kevin Donahoe	Guest	GE Renewable Energy
Daniel Ransom	Guest	GE Renewable Energy
Mike Jensen	Guest	Pacific Gas and Electric Company
Subrahmanyam Venkata	Voting Member	Venkata Consulting Solutions Inc.
Michael Higginson	Chair	S&C Electric Company
Manish Patel	Vice-Chair	Southern Company Services
Joerg Blumschein	Voting Member	SIEMENS
Stephen Conrad	Guest	Public Service Co of NM - Retired
Ian Tualla	Guest	Duke Energy
Jeff Dagle	Guest	Pacific Northwest National Laboratory
Christopher Walker	Voting Member	Mesa Associates, Inc
Mark Mcchesney	Guest	Oncor
Rafael Garcia	Voting Member	Oncor Electric Delivery
Addis Kifle	Voting Member	Georgia Transmission Corporation
William English	Guest	Consumers Energy
Kenneth Martin	Voting Member	EPG
Nathanael Kamm	Guest	TRC Companies Inc.
Brandon Davies	Guest	TRC
Gene Henneberg	Voting Member	NV Energy
Sudarshan Byreddy	Guest	Burns & McDonnell
Duane Buchanan	Guest	HDR Engineering
Milo Daub	Guest	MESA Associates
Aboutaleb Haddadi	Guest	EPRI
April Underwood	Guest	Southern Company Services
Joshua Hughes	Guest	Qualus Power Services
Looja Tuladhar	Voting Member	Daymark Energy Advisors
James Niemira	Guest	S&C Electric Company
Adrian Zvarych	Guest	Qualus Power Services
Malia Zaman	Guest	IEEE

Bernard Matta	Guest	SEL
Sachintha Kariyawasam	Guest	Power Engineers
William Thompson	Guest	Black & Veatch
Milton Quinterus	Guest	Entergy
Austin Penny	Guest	Entergy
Mathew King	Guest	HDR Inc
Greg Hataway	Guest	Burns & McDonnell
Abdelhamid Elarchi	Guest	Hydro Quebec
Henry Quin	Guest	Entergy
Diane Nguyen	Guest	Entergy
Joel Ankevy	Guest	Pacific Corp
Matthew Mulka	Guest	Sargent & Lundy
Mike Basler	Guest	Basler Electric
Amin Banaie	Guest	GE
Brian Boysen	Guest	WEC Energy Group
Charles Henville	Guest	Henville Consulting Inc.
Daqing Hou	Guest	Schweitzer Engineering Labs.
Ding Lin	Guest	Manitoba Hydro
Donald Ware	Voting Member	Qualus Power Services
Evangelos Farantatos	Voting Member	EPRI
Jay Anderson	Voting Member	ComEd - Exelon Corp.
Juan Pineros	Guest	XM S.A. Colombia Power System Operator
Kevin Malpede	Guest	Com Ed
Kevin Jones	Voting Member	Xcel Energy
Laurel Brandt	Guest	TVA
Paras Patel	Guest	TRC Companies Inc.
Taylor Raffield	Guest	Duke Energy
Richard Hunt	Voting Member	Quanta Technology
Robert Fowler	Voting Member	Southern California Edison
Sukumar Kamalasadan	Guest	University of North Carolina at Charlotte
Vahid Madani	Guest	GridTology
Jalal Gohari	Guest	WSP
James van de Ligt	Voting Member	Spark Power Corp.
Van Le	Guest	Western Area Power Administration
Byungtae Jang	Guest	KEPCO

Working Group Minutes

C23: Coordination of Synchrophasor Related Activities

Chair: **Yi Hu**
Vice Chair: **Gustavo Brunello**
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 working group 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 January 8, 2024 at 5:00 PM CST

Meeting Location: Sheraton Hotel, New Orleans, LA, USA

Attendance: 4 out of 14 members and 15 guests attended.

M or G?	Attended	First Name	Last name	Affiliation
G	Virtual	Evangelos	Farantatos	EPRI
G	Virtual	Mahendra	Patel	EPRI
G	Virtual	Nirmal	Nair	University of Auckland
G	Virtual	Byungtae	Jang	KEPCO
M	In-Person	Yi	Hu	Quanta Technology
M	In-Person	Ken	Martin	EPG
G	In-Person	Michael	Balestrieri	SCA
G	In-Person	Hamed	Mohsenian-Rad	UCR
G	In-Person	Dinesh	Gurusinghe	RTDS
G	In-Person	Sachintha	Kariyawasam	Power Engineers
G	In-Person	Arun	Shrestha	SEL
G	In-Person	Manish	Patel	SCS
G	In-Person	Dragan	Tabakovic	Hubbell
G	In-Person	Peiman	Dadkhah	NiGrid Power
M	In-Person	Jeff	Dagle	PNNL
M	In-Person	Jim	O'Brien	Duke Energy
G	In-Person	Nuwan	Perera	Power Engineers
G	In-Person	Michael	Higginson	S&C
G	In-Person	Mark	Adamiak	Adamiak Consulting

Call to order: 5:00 PM CST

Officer presiding: Yi Hu

Officer recording minutes: Yi Hu

Quorum was not 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 not shown at this meeting

Meeting Agenda: Agenda was shown

Meeting minutes: 2023 September meeting minutes was emailed to WG members prior to the meeting

Summary of Activities, Discussions, and Action Items

- A round-table introduction was caried out for all in-person and virtual attendees
- WG Chair along with Jeff Dagle of PNNL reviewed the general NASPI organization information
- Jeff Dagle of PNNL informed the attendees that the next NASPI meeting will be held on April 16-17 at Salt Lake City, UT – those interested to make a presentation were encouraged to submit abstracts to naspi@pnnl.gov no later than February 1, 2024.
- WG Chair reviewed the current NASPI activities as reported at September 2023 NASPI work group meeting
- WG Chair initiated a discussion whether some IEEE activities should be started in the area of the application of synchronized waveform sample measurement. The following was discussed:
  - A common term may need to be agreed and clearly defined as currently there are several terms used (synchro-waveform, continuous point-on-wave, synchronized measurement, sampled values, etc.) to describe essentially the same type of measurement
  - Impact of sensors (CTs/PTs) and analog filters on such measurement data
  - Performance requirements of such measurement data for applications using the data
  - An IEEE task force, “Big Data Analytics for Synchro-Waveform Measurements”, has been established for identifying big data analytics applications using synchro-waveform measurements
  - Consensus of attendees is that WG C23 should propose to PSRC C subcommittee to create a new task force to investigate whether IEEE should initiate/undertake any specific activities
- Action items
  - It was agreed WG C23 will meet at May PSRC meeting to develop an assignment statement for the task force and request C subcommittee approval at May 2024 PSRC/PSCCC meeting
  - Prior to May 2024 PSRC/PSCCC meeting, Chair will coordinate with Jeff Dagle to solicit input from NASPI community at the April 2024 NASPI meeting regarding the application of synchronized waveform sample measurement
  - WG Chair will report IEEE synchrophasor related activities at the NASPI April 2024 meeting based on the reporting of WGs/TFs at JTCM
- Old Business:
  - None
- New Business:
  - None

Meeting adjourned at 6:10 PM CST.

Upcoming IEEE PSRC/PSCCC and NASPI Meetings:

- Next NASPI Work Group Meeting, April 16-17, 2024, Salt Lake City, UT, USA
- Next WG C23 meeting will be held in conjunction with PSRC/PSCCC meeting, May 13-16, 2024, Buffalo, NY, USA

Next meeting:

- Single session to be held in conjunction with PSRC/PSCCC 2024 May meeting.
- A room for 20 people.
- HD projector with HDMI connector.
- Keep the meeting time on Monday 5:00 – 6:10 PM.

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 2025
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 in a hybrid session with 4-voting members and 9-guests (13-total attendees) on Tuesday, January 9, 2024, 8:00-9:10 AM EST.

The past meeting minutes were reviewed and approved. Kevin mentioned that in past meetings, the C29 WG in coordination with the D29 WG was thinking about doing an industry survey. However, after further thinking, it was concluded that industry survey may distract the WG and hence, decided to not pursue it.

Kevin gave a brief explanation of the background and history of C29 for the benefit of the first time attendees. The outline of the draft report was reviewed. Gene Henneberg volunteered to review updates and outstanding comments for sections 1-3. Kevin mentioned that there may be an opportunity to swap order of sections 5 and 6 for better readability.

Kevin then presented example calculations from the D29 WG draft report. Kevin called for volunteers to start thinking about how to test the PSB/OST schemes based on examples in the D29 WG draft report. One option is to run time domain simulation and create a COMTRADE file for stable and unstable power swings, which can then be used to test PSB/OST schemes in a relay. Christopher Ness offered to help. Christopher has a test set that can used to run tests, however, need a relay to test. Christopher will get in touch with Gene Henneberg to discuss logistics of such a testing.

Kevin summarized that the overall goal of the D29 WG report is to provide a tutorial on how to develop relay settings for PSB/OST schemes and the C29 WG report to show how to test PSB/OST schemes.

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

First	Last	Affiliation	Status
Matchyaraju	Alla		Guest
Koustubh	Banerjee	Eversource Energy	Guest
Scott	Cooper	Omicron	Voting Member
Michael	Derrick	Westinghouse	Guest
Gene	Heneberg	NV Energy	Voting Member
Joshua	Hughes	Qualus	Guest
Kevin	Jones	Xcel Energy	Voting Member
Daniel	Lebeau	Hydro-Quebec	Guest
Chase	Lockhart	1898 & Co.	Guest
Christopher	Ness	Megger	Guest
Manish	Patel	Southern Company Services	Guest
Looja	Tuladhar	Daymark Energy Advisors	Guest
Benton	Vandiver	Hitachi Energy	Voting Member

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: May 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.

January 9, 2024 Meeting Minutes Hybrid Meeting

Officer Presiding: S. S. (Mani) Venkata
Minutes Prepared By: Michael Higginson

This meeting was in-person (New Orleans, LA) and online hybrid. The meeting commenced at 8:00 AM EST. There were 52 attendees, with 14 voting members, 6 non-voting members, and 32 non-members. Quorum was 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 September 2023 meeting were reviewed. No comments were raised. Minutes could not be approved because quorum was not met at this point in the 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.

All comments have been resolved, and only editorial finalization is required before recirculation.

The working group discussed next steps for completion of our Guide.
- Working group officers will circulate the draft to working group members in two weeks.
- The revised draft will be recirculated through the IEEE SA ballot for 3 or 4 weeks, considering the volume of changes.

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

Attendees:

Full Name	Affiliation	Status
Abu Bapary	AEP	Non-Voting Member
Addis Kifle	Georgia Transmission Corporation	Non-Member
Ajmal Saeed	Pacific Gas & Electric Company	Non-Member
Amin Banaie	EPRI	Non-Member
Amin Zamani	Quanta Technology	Voting Member
Andre Melo	Schneider Electric	Non-Member
Andre Uribe	Systema Resources	Non-Member
Anthony Johnson	Southern California Edison	Non-Member
Athula Rajapakse	University of Manitoba	Non-Voting Member
Austin Wade	SEL	Non-Member
Ben Kazimier	Bender Inc.	Voting Member
Brandon Davies	TRC	Non-Voting Member
Bryan Hosseini	Duke Energy	Non-Member
Chikashi Komatsu	Hitachi	Non-Member

Cody Collins	Qualus	Non-Member
Craig Holt	Xcel Energy	Non-Member
Dhruv Patel	Hubbell	Non-Member
Duane Buchanan	Power Grid Engineering	Non-Member
Geza Joos	McGill University	Secretary
Harsh Vardhan	GE	Non-Member
Jada Hawaz	SEL	Non-Member
Jade Fital		Non-Member
Jay Herman	EPRI	Non-Voting Member
Jim van de Ligt	CANA High Voltage	Voting Member
Juan Gers	Gers USA	Non-Member
Kamal Garg	SEL	Non-Voting Member
Koustubh Banerjee	Eversource	Non-Member
Looja Tuladhar	Daymark Energy Advisors	Voting Member
Lynn Schroeder	MKEL Engineering	Non-Member
Mike Basler	Basler Electric	Non-Member
Matthew Reno	Sandia National Labs	Voting Member
Michael Bloder	Commonwealth Associates	Voting Member
Michael Higginson	S&C	Vice-Chair
Michael Thesing	Patterson & Dewar Engineers	Non-Member
Milton Quinteros	Entergy	Non-Member
Mohammad Zadeh	ETAP	Voting Member
Mohit Sharma	SEL	Non-Member
Nathan Kassees	Xcel Energy	Non-Member
Nirmal Nair	University of Auckland	Non-Member
Nuwan Perera	POWER Engineers	Non-Member
Paras Patel	TRC	Non-Member
Paul Nyombi	Onward Energy	Non-Member
Raluca Lascu	DTE	Voting Member
Randy Hamilton	Basler Electric Co	Non-Voting Member
S.S. (Mani) Venkata	Venkata Consulting Solutions	Chair
Sebastien Billaut	Commonwealth Associates	Voting Member
Stephen Conrad		Non-Member
Steve Miller		Non-Member
Sukumar Kamalasadan	UNC Charlotte	Voting Member
Swagata Das	SEL	Non-Member
Ward Bower	Ward Bower Innovations	Voting Member
Yazid Alkraimeen	Siemens	Non-Member

C39: IEEE PC37.252 Guide for Testing Auto 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.

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 2024
Draft: 0.5

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, January 09, 2023, at 10:40 a.m. (CDT) with 18 participants (13 in-person and 5 remote; 6 members & 12 guests) in New Orleans, LA. Ken Martin (Chair) welcomed participants and briefed the WG's objective, described in the assignment above. There were 4 members present and quorum was not met. Ken reviewed the patent and copyright policies for WG. Without a quorum the previous minutes were not approved.

Ken presented the draft report covering distribution requirements and summarizing recordings from various locations. These recordings encompassed noise, harmonics, fault currents, and the rate of change of frequency and voltage. He also highlighted the challenges in developing a technical report that distinguishes between transmission and distribution applications for PMUs. The working group aimed to identify the characteristics and data requirements for distribution applications and make recommendations accordingly. Additionally, he underscored existing standards and outlined the working group's plan, including the analysis of distribution measurement environments.

Nuwan discussed his work on power quality assessment and analysis, focusing on interactions with utilities to gather information about limits and requirements for harmonics and other power quality aspects.

Ken Martin provided an example by examining the requirements for advanced Volt/VAR control applications, highlighting the importance of accuracy, measurement bandwidth, frequency range, and interference rejection.

Ken emphasized the importance of contributions from WG members with experience in distribution systems and applications. He requested contributors to fill in the table with recommended values for accuracy, measurement bandwidth, frequency range, and interference rejection.

The meeting concluded with an invitation for additional contributions and participation in the working group.

The meeting was adjourned at 11:45.

Recorded by Dinesh Gurusinghe.

#	Attendee	Affiliation	M/G
1.	Ken Martin	EPG	C
2.	Nuwan Perera	Stantec	VC
3.	Dinesh Gurusinghe	RTDS	S
4.	Jorg Blumschein	Siemens	G
5.	Sachintha Kariyawasam	Power	G
6.	Jeff Dagle	PNNL	G
7.	Eric Udren	Quanta Technology	M
8.	Peiman Dadkheh	NuGrid	G
9.	Evengelos Farantalos	EPRI	G
10.	Sukumar Brahma	Clemson U	G
11.	Josue Sanchez		G
12.	Oscar Bolado	Quanta Technology	G
13.	Stephane Do	Powerside	G
14.	Vahid Madani		G
15.	Byungtae Jang		G
16.	Xiangyu Ding		M
17.	Brian Boysen		G
18.	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: **Zheyuan Cheng**
PAR expiration: **N/A**
Established: **January 2021**
Completion: **December 2023**
Output: **N/A**
Draft: **N/A**

C43 Assignment: *Prepare a report summarizing existing and new practical applications and challenges to use Artificial Intelligence and Machine Learning technologies for power system protection and control.*

Meeting Date and Time: Hybrid meeting, On January 10, 2024 at 10:40 AM CST

Meeting Location: Sheraton Hotel, New Orleans, LA, USA

Attendance: 13 out of 35 members and 40 guests attended.

M or G?	Attended	First Name	Last Name	Affiliation
G	Virtual	Amin	Banaie	EPRI
G	Virtual	Dhruv	Patel	Hubbell
G	Virtual	Jose	Ruiz	Doble
M	Virtual	Juan	Pineros	XM -Columbia
G	Virtual	Manish	Das	GE
M	Virtual	Matthew	Reno	S&C
G	Virtual	Miguel	Rios	Southern Company
M	Virtual	Nirmal	Nair	University of Auckland
G	Virtual	Priya	Raghuraman	Siemens
G	Virtual	Randy	Hamilton	Basler
G	Virtual	Ratan	Das	GE Gas Power
M	Virtual	Robert	Fowler	ENTRUST Solutions
G	Virtual	Sajal	Harmukh	?
M	Virtual	Sukumar	Kamalasadan	UNC Charlotte
M	Virtual	Vahid	Madani	Gridtology
G	Virtual	Byungtae	Jang	KEPCO
G	Virtual	Vincent	Kwong	Lower Colorado River Authority
M	In-person	Carolina	Arbona	Burns&McDonnnell
G	In-person	Genariel	Hernández	Quanta Technology
M	In-person	Yi	Hu	Quanta Technology
G	In-person	April	Underwood	Southern Company Services
G	In-person	Kim	Pate	Fibrebond
G	In-person	Sean	Black	Fibrebond

M or G?	Attended	First Name	Last Name	Affiliation
G	In-person	Jada	Hawaz	SEL
G	In-person	Erin	Jessup	SEL
M	In-person	Anthony	Montoya	KBR/DOE
G	In-person	Ted	Hlibka	Retired
G	In-person	Nicholas	Kraemer	NuGrid Power
G	In-person	Paul	Nichols	Agbara Eng
G	In-person	Ajmal	Saeed	PG&E
G	In-person	Duane	Buchanan	HDR
G	In-person	Chase	Lockhart	1898 & Co. Part of Burns & McDonnell
G	In-person	Melvin	Moncey Joseph	Black & Veatch
G	In-person	Aboutaleb	Haddadi	EPRI
G	In-person	Fredy	Bravo	Duke Energy
G	In-person	Mohasinina	Kamalasadan	SCE
G	In-person	Maziar	Isapour	SCE
G	In-person	Milo	Daub	Mesa Assoc.
G	In-person	Ravindrananth	Ramlachan	GE
G	In-person	Justin	Turner	GE
G	In-person	Brian	Boysen	We Energies
M	In-person	Alex	Apostolov	Omicron
M	In-person	Dan	Sabin	Schneider Electric
G	In-person	Jeff	Wischkaemper	Texas A&M
G	In-person	Theo	Laughner	Lifescale Analytics
M	In-person	Abder	Elandaloussi	SCE
G	In-person	Cory	Byrnes	Beta Engineering
G	In-person	Ethan	Urbina	Beta Engineering
G	In-person	Daniel	Lebeau	Hydro-Quebec
G	In-person	Addis	Kifle	GTC
M	In-person	Michael	Higginson	S&C
G	In-person	Lin	Shi	GE Vernova
G	In-person	Yanfeng	Gong	SEL

Call to order: 10:40 AM CST

Officer presiding: Yi Hu

Officer recording minutes: Yi Hu

Quorum was not 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 not shown at this meeting.

Meeting Agenda: Agenda was shown.

Meeting minutes: 2023 September meeting minutes was emailed to WG members prior to the meeting.

Summary of Activities, Discussions, and Action Items

Working Group C-43 met in a hybrid single-session on January 10, 2024 with 53 (36 in-person, 17 remote) attendees included 13 WG members. Yi Hu presided the meeting in-person and reviewed

the WG C-43 assignment at the start of the session. A round-the-table introduction of all attendees was taken.

Yi reported that the report has been posted to IEEE PES Resource Center on September 22, 2023, which can be downloaded free of charge by PES members, and a PSRC WG C43 report with identical contents was also posted to PSRC's knowledge base, which can be downloaded by anyone free of charge.

Yi informed the attendees that based on previous discussion with C subcommittee officers, input from WG members, and inquiry from many guest attendees, the WG has compiled a list of work items for developing a revised report. The draft list of work items was reviewed and discussed, and finalized with no further changes.

Based on the feedback from C subcommittee Yi led the discussion and development of the revised WG assignment statement as follows to more accurately describe WG's changed assignment.

WG C43 Revised 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.

WG chair will make a motion at the C subcommittee meeting for requesting the continuation of the WG C43 work (Note: the motion has been approved.).

The meeting attendees were informed for the following items and the action items:

- PAC World Magazine has invited WG C43 to submit an article (<3,000 words) for its June 2024 issue with a focus on practical application examples. The WG Chair will reach out to relevant WG members for putting together this article.
- The WG has submitted two panel applications for IEEE 2024 conferences: one for IEEE PES T&D (Accepted) and IEEE PES GM (Pending acceptance notification). Both panels could add one more panelist. Anyone interested to participate at these panels as a panelist please contact and discuss with Abder Elandaloussi (abder.elandaloussi@sce.com, Moderator for both panels).

Meeting adjourned at 11:50 AM CST.

Next meeting:

- Double-session to be held in conjunction with PSRC/PSCCC meeting in May 2024, Buffalo, NY.
- 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"

C44 met at 8:00am CST on Wednesday 01/10/2024 with 10 attendees - 7 in person and 3 remote.

The meeting started with introductions. Then Sukumar summarized the status of the paper as follows.

The paper has been accepted by the 2024 Texas A&M Annual Conference for Protective Relay Engineers. Sukumar will prepare the slides based on the presentation given at the PSRC main committee meeting, circulate for any edits among the WG members and finally present at the conference.

Also, reviewer comments were received for the paper submitted to the IEEE Transactions on Energy Conversion (TEC), and they were discussed during the meeting. It was concluded that in order to address the comments material that is not within the content of the C24 report would be needed, thus it was decided to not proceed with revision of the paper.

Finally, it was discussed that the paper can be also submitted for presentation at other protective relaying conferences such as the Georgia Tech Protective Relaying conference and Western Protective Relay Conference. This will be pursued depending on availability of WG members to attend these meetings and present.

The WG does not plan to meet during the next meeting.

Name	Affiliation	Role
Manish Patel	Southern Company	Member
Aboutaleb Haddadi	EPRI	Member
Mohammad Zadeh	ETAP	Member
Ritwik Chowdhury	SEL	Guest
Steve Conrad	Retired	Guest
Addis Kifle	Georgia Transmission Company	Guest
Ding Ling	Manitoba Hydro	Guest
Jorge Velez	Quanta Technology	Guest
Evangelos Farantatos	EPRI	Vice Chair
Sukumar Brahma	Clemson University	Chair

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: 2024

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.

A working group quorum was achieved with 19 out of 35 members in attendance. Sukumar motioned and Steve Miller seconded to approve the September meeting minutes.

Thanh Nguyen from ASPEN presented on Short Circuit Program IBR Model. There was the following discussion:

- There was a discussion on the IBR terminal voltage on how it is calculated for the three phase fault at the POI where the IBR is isolated from the grid. There was also discussion on how it is assumed to be memorized from the prefault versus how it might be frozen or impacted based on the IBR controls.
- If the IBR is in Q-priority mode, it may initially try to inject pure reactive current but eventually converge to the solution determined by the network impedance.
- For the dll model implementation, a couple of software vendors (ASPEN and ETAP) have been able to implement it along with one IBR OEM (Siemens-Gamesa) model.
- There was a concern that the dll models are not yet being shared with practitioners by the IBR OEMs.
- There are other hurdles with respect to ownership of the dll model in case there are issues.

A pdf copy of the presentation is available in the following link for one year: https://psrc.sharefile.com/d-s588bb92b11fd4a7c8decf78d50c29a54. If there are any questions, email tnguyen@selinc.com or cweldy@aspeninc.com.

We are interested in coordinating with WG D48 to see what can be said for Section 5.8.4 Single-phase tripping and reclosing. **Kamal Garg** can help coordinate the effort.

There were reviewers who signed up to help review the following sections:

- 5.3 Distance Protection—**Koustubh Banerjee, Genariel Hernandez, Ajmal Saeed, Sebastien Billaut, Ram Viswanathan, Jack Fital.**
- 5.8.1 Mutually Coupled Lines—**Sukumar Kamalasadan, Robert Fowler, Stephen Miller.**
- 5.8.2 SIR—**Sebastien Billaut, Mohammed Zadeh, Jack Fital.**
- 6.2.4 Bus protection—**Mike Jensen, Sebastien Billaut, Jack Fital.**

Meeting Participants:

First Name	Last Name	Affiliation	Role*
Ali	Hooshyar	University of Toronto	C
Manish	Patel	Southern Company Services	VC
Ritwik	Chowdhury	SEL	S
Michael	Higginson	S&C Electric Company	M
Ilia	Voloh	General Electric	M
Raluca	Lascu	DTE	G
Charles	Henville	Henville Consulting Inc.	NVM
Ratan	Das	GE Vernova	M
Evangelos	Farantatos	EPRI	M
Amin	Zamani	Quanta Technologies	M
Jason	Eruneo	Duke Energy	M
Sukumar	Brahma	Clemson University	M
Aboutaleb	Haddadi	EPRI	M
Michael	Jensen	PG&E	M
Robert	Fowler	ENTrust Solutions Group	NVM
Rafael	Garcia	Oncor	G
Alla	Deronja	ATC	G
Stephen	Miller	Energy Emissions Intelligence	M

Sebastien	Billaut	Commonwealth Associates	M
Matthew	Reno	Sandia	M
Duane	Buchanan	HDR	G
Looja	Tuladhar	Daymark Energy	M
Kamal	Garg	SEL	M
Sukumar	Kamalasadan	UNC Charlotte	M
Laurel	Brandt	TVA	G
Yi	Hu	Quanta Technologies	G
Ryan	McDaniel	SEL	NVM
Jim	O'Brien	Duke Energy	G
Brian	Johnson	University of Idaho	NVM
Chikashi	Komatsu	Hitachi Ltd	G
Matt	Black	Sargent & Lundy	G
Kevin	Donahoe	GE	G
Miguel	Rios	Southern Company Services	G
Joshua	Hughes	Qualus	G
Byungtae	Jang	KEPCO	G
Stephen	Conrad	Retired	G
Jim	Van de Ligt	CANA Energy Ltd	G
Matchyaraju	Alla	Amazon	M
Amin	Banaie	EPRI	M
Genariel	Hernandez	Quanta Technologies	NVM
Van	Le	WAPA	G
Thanh	Nguyen	ASPEN, Inc.	G
Carolina	Arbona	Burns & McDonnell	G
Chase	Lockhart	Burns & McDonnell	NVM
Christopher	Weldy	ASPEN, Inc.	G
Prem	Kumar	Bechtel	G
Scott	Elling	Burns & McDonnell	G
Mark	McChesney	Oncor	G
Sajal	Harmukh	SEL	G
Mohammed	Zadeh	ETAP	NVM
Ajmal	Saeed	PG&E	NVM
Koustubh	Banerjee	Eversource Energy	NVM
Dhruv	Patel	Hubbell	G
Fredy	Bravo	Duke Energy	G
Ethan	Grindle	ATC	G
Milton	Quinteros	Entergy	G
Milo	Daub	Mesa Associates	G
Melvin	Moncey Joseph	Black & Veatch	G
Dinesh	Gurusinghe	RTDS	G
Sabhari Rajan	Periyaandhavar	PNM	G
Mahtab	Vahabpour	PNM	G
Mike	Basler	Basler	G
Steve	Turner	APS	G
Tim	Lensmire	Enercon	G

Greg	Hataway	Burns & McDonnell	G
Ian	Higginson	Bentley Systems	G
Tom	Farr	Eaton	G
Mathew	King	HDR	G
Jack	Fital	Entergy	NVM
Ram	Viswanathan	Entergy	NVM

*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 January 9, 2024, at 13:00 CST with 14 attendees in person and 9 attendees online.

Chair, Evangelos presided over the meeting. He brought the meeting to order and showed the agenda. The agenda was changed as the presenter “Sakis Meliopoulos” could not attend due to a delay in his flight. Then chair

- reviewed the scope of the taskforce.
- summarized the status of the report drafted by the PSDP taskforce members.
- reviewed previous meetings and presentations.
- informed that he is working with PSRC webmaster to upload the latest draft of PSPD report so the link can be shared for members to review.

Later, a question was raised by Mohammad Zadeh regarding the difference between the phasor angle calculated by transient stability programs versus the phasor angle required by relay

algorithm during off- nominal frequency operation. In transient stability programs, the nominal frequency framework is used to calculate phasors at each node. This means that node angles will vary in time during off-nominal frequency operation. Whereas, in relays, there is a frequency tracking algorithm and adaptive sampling rate that results in steady phasor angle during the off-nominal frequency operation. This can potentially impact protection functions such as memory polarization in distance protection function. Attendees discussed the problem and Mohammad Zadeh will update the task force members in the next meeting regarding the simulated case to demonstrate the issue, possible impact on protection functions, and how to address that in the relay model for RMS dynamic simulations.

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.

Name	Affiliation	Role
Chase Lockhart	1898 & Co.	
Ilia Voloh	GE	
James van de Ligt	Shaw	
Mahendra Patel	EPRI	
Matthew Reno	Sandia National Lab	
Raluca Lascu	DTE Energy	
Robert Fowler	ENTRUST Solutions Group	
Sajal Harmukh	SEL	
Mahtab Vahabpour	PNM	
Mike Basler	Basler	
Aboutaleb Haddadi	EPRI	
Stephen Miller	EPRI	
Miguel Rios	Southern Company	
Genariel Hernandez	Quanta Technology	
Jack Fital	Entergy	
Diane Nguyen	Entergy	
Austin Penny	Entergy	
Henry H. Quin	Entergy	
Milton Quniteros	Entergy	
Michael Higginson	S&C	
Yi Hu	Quanta Technology	
Evangelos Farantatos	EPRI	Chair
Mohammad Zadeh	ETAP	Vice Chair

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 2024
Draft: 6

Assignment: Write a conference paper for C37.120 IEEE Guide for Protection System Redundancy for Power System Reliability.

WG C48 met on Tuesday, January 9, 2024, in a single session with 8 members and 17 guests attending.

The PSRC September 9 WG meeting minutes were approved. Motion: Manish Patel, 2nd: Craig Palmer.

The conference paper has been accepted to be presented at the Texas A&M 2024 relay conference. It was rejected by the Georgia Tech 2024 because its abstract was accidentally submitted after the due date. We plan to resubmit the paper to the 2024 WPRC and MIPSYCON.

The WG chair earlier suggested to consider writing an IEEE Transactions paper to increase the visibility of the new guide and promote greater insight into guide material. Since the September meeting, the WG voted electronically to proceed with writing the Transactions paper.
The WG chair has reviewed the WG C31 (that developed the guide) meeting minutes and selected some additional topics that can be a part of the future Transactions paper. These topics should be addressing the “gray” areas and the thought process of the WG when documenting them in the guide. The material may include more data, examples, and the WG discussion points made during the WG C31 meetings.

At the meeting, the WG chair presented some of these additional topics to include in the summary paper that the WG initially completed for the relay conferences and convert it into a Transactions paper.

The meeting participants proposed more additional topics, so there are about 10 topics that can be added or expanded on in the future IEEE Transactions paper.

The assignments have been distributed for writeups of the additional topics. The writeups are due to the WG chair at or by March 31, 2024. The WG chair will incorporate them in the final draft of the conference paper and will create Draft 1 of the Transactions paper.

For the next meeting, we request a room for 20 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	Joel	Ankeny	PacificCorp
Guest	Hasnain	Ashrafi	Sargent & Lundy
Guest	Laurel	Brandt	TVA
Guest	Duane	Buchanan	HDR
Guest	Peiman	Dadkhah	NuGrid Power
Guest	Ken	Fodero	SEL
Guest	Scott	Hayes	PG&E
Guest	Byungtae	Jang	KEPCO
Guest	Kevin	Malpede	ComEd
Guest	Bernard	Matta	SEL
Guest	Jim	O'Brien	Duke Energy
Guest	Mike	Ramlachan	GE Vernova
Guest	Neil	Saia	Entergy
Guest	Angelo	Tempone	Duke Energy
Guest	Ian	Tualla	Duke Energy
Guest	Mahtab	Vahabpour	PNM
Guest	Ram	Viswanathan	Entergy
Member	Kevin	Donahoe	GE Renewable

Member	Addis	Kifle	Georgia Transmission
Member	Craig	Palmer	PowerComm Solutions
Member	Manish	Patel	Southern Company Services
Member	Juan	Piñeros - XM	XM SA ESP
Member	Don	Ware	Power Grid Engineering
Member/Chair	Alla	Deronja	ATC
Member/Vice-chair	Melvin	Moncey Joseph	Black & Veatch

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 January 10, 2024, at 09:10–10:30AM CST. There was a total of 28 attendees in the meeting (16 in-person and 11 online).

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. The chair explained that the WG assignment is to expand the current TR and cover other types of IBRs.
- The Chair provided an update on the status of the report and the assignments provided. Very good progress has been made since September meeting.
- It was agreed to change the title of the TR report to "Protection of Inverter Based Resource Generating Facilities".
- The team discussed the grounding scheme at the IBR plant. It was agreed to clarify that the use of grounding transformer will be done based on step-up transformer configuration and some TOV studies. This, verbiage will be added to Section 2.2 to clarify that the collector system requires its own ground source (Amin to add some clarifying sentences to Section 2.2).
- It was discussed that protection design needs to ensure that the grounding bank is the last element to trip (in case of a fault within the facility).
- Manish suggested to move Section 2.8 out of Section 2 (not related to this section) and combine it with Section 3.1.2. The WG agreed. Specially

- Juan offered to provide an example of voltage and frequency protection for a 110MW plant in Columbia.
- The chair announced that we may have a call between this meeting and the May meeting.
- The meeting was adjourned at 10:30 AM CST.

For next meeting, we request a room for 30 people with a projector. Please avoid conflicts with C45, D43, K31, and D45.

Name	Company
Raluca Lascu	DTE
Genariel Hernandez	Quanta Technology
Amin Zamani	Quanta Technology
Matthew Reno	Sandia National Lab
Brandon Davies	TRC COMPANIES INC
Paras Patel (TRC)	TRC COMPANIES INC
Jim van de Ligt	Spark Power Corp.
Manish Patel	Southern Company
Jorge Velez	Quanta Technology
Van Le	WAPA
Duane Buchanan	HDR
Jason Eruneo	Duke Energy
Chase Lockhart	1898andCo
Nathanael Kamm	TRC COMPANIES INC
April Patrice Underwood	Southern Company
Juan Piñeros	XM
Carolyn Sun	Black & Veatch
Sajal Harmukh	SEL
Addis Kifle	GTC
Milo Daub	Mesa Associates
Alla Deronja	ATC
Dinesh Gurusinghe	RTDS
Diane Nguyen	Entergy
Gene Henneberg	NV Energy
Brian Boysen	WE Energies
Aboutaleb Haddadi	EPRI
Amin Banaie	EPRI
Bonian Shi	

CTF51: Investigate revising C37.117, Guide for Application of Protective Relays Used for Abnormal Frequency Load Shedding and Restoration

Chair: Kevin W. Jones
Vice Chair: TBD
Secretary: N/A
Output: Guide
Established Date: January 2023
Expected Completion Date: TBD
Draft: NA

Assignment: Investigate revising C37.117, Guide for the Application of Protective Relays Used for Abnormal Frequency Load Shedding and Restoration.

CTF51 met in a single session with 7 in-person attendees and 6 virtual attendees. The meeting was started with introductions in the room and virtual. The chair mentioned that the original guide is now inactive and that there was a task force formed to revise the guide, but it was decided then to not revise it. The Chair informed the task force that since then there is an increase of IBRs in the system, lower system inertia results, which yields higher Rate-of-Change-of-Frequency (RoCoF) for loss of large amounts of generation. Due to the higher RoCoF, more levels of UFLS may trip, resulting in a frequency overshoot that could result in generation tripping on over-frequency.

The Chair then briefly reviewed the Guide C37.117. It was recognized that modifying UFLS relay settings is one of the options to mitigate frequency excursion events for the future power system. Other options include, but not limited to, are as follows: use of synchronous condensers to increase inertia, use of battery energy storage resources to provide fast frequency response, extracting inertia from wind turbine generators to arrest frequency decline, etc. After further discussions, two possible options emerged: revive and modify the Guide C37.117 OR prepare a technical report to detailing underfrequency excursion mitigation strategies. One attendee voted to revive and modify the IEEE Guide C37.117. Eight (8) attendees voted to prepare a technical report.

At the C-SC meeting, the chair, on behalf of CTF51, will motion to create a new working group with following assignment: Prepare a technical report on underfrequency excursion mitigation strategies for changing generation resource mixes in the bulk power system.

The Chair thanked everyone who attended the meeting.

Requirements for the WG meeting (pending C-SC approval): A projector and a room for approximately 30 people.

First	Last	Affiliation	Status
Brian	Boysen	We Energies	Guest
Milo	Daub	Mesa Associates	Guest
Evangelos	Farantatos	EPRI	Guest
Rob	Fowler		Guest
Genariel	Hernandez	Quanta Technology	Guest
Michael	Higginson	S&C	Guest
Kevin	Jones	Xcel Energy	Voting Member

Mathew	King	HDR Engineering	Guest
Chase	Lockhart	1898 & Co.	Guest
Manish	Patel	Southern Company Services	Guest
Miguel	Rios	Southern Company Services	Guest
Bonian	Shi		Guest
April	Underwood	Southern Company Services	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 01/09/2024 meeting from 3:40 to 4:50 PM CST

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) Approval of Agenda (motion and second) – Mike Jensen 1st, Steve Pierce 2nd.
f) Summary of discussions and conclusions including any motions.
    a. Discussion to review and finalize PAR for submission to C-Sub Committee
        i. Scope is reviewed by the members in the room. Revised scope includes to the sub-transmission interconnected energy resources.
        ii. Purpose is reviewed by the members in the room. Changed language from transmission and generation owners to asset owners.
        iii. Alla Deronja will attend I2 WG meeting request them to assign a liaison for the WG.
        iv. Ajmal Saeed made the motion to approve the scope and purpose and send to C-Sub Committee for approval.
        v. Mike Jensen seconded
        vi. Motion carries without objection.
    b. Chair showed the need for the PAR on IEEE MyProject.
g) Recess and time of final adjournment: Adjourned by Melvin at 4:50 PM CST.
h) **Attendance:** 31 Attendees – 18 Members, 11 Guests, 2 Guests Online
i) Next meeting date and location at: May 2024 in Buffalo, NY at PSRC Meeting. For next meeting, we request a room for 40 people with a projector. Please avoid conflicts with B3, C45, C48, C50, D37, D42, D53, J17, K27, I49/P21

MEETING PARTICIPANTS JAN 2024:

No.	NAME	AFFILIATION	ROLE

1	Melvin Moncey Joseph	Black & Veatch	Member
2	Mike Jensen	PG&E	Member
3	Muhammad Hamid	Black & Veatch	Member
4	Milo Daub	Mesa Associates	Member
5	Duane Buchanan	HDR	Member
6	Matthew King	HDR	Member
7	Todd Martin	Basler	Member
8	Sachintha Karyawasam	Power Engineers	Member
9	Addis Kifle	GTC	Member
10	Ian Tualla	Duke Energy	Member
11	Michael Higginson	S&C	Member
12	Nuwan Perera	Power Engineers	Member
13	Chase Lockhart	Burns & McDonnell	Member
14	Looja Tuladhar	Daymark Energy Advisors	Member
15	Daniel Lebeau	Hydro-Quebec	Member
16	Ajmal Saeed	PG&E	Member
17	Sunil Kabra	Westinghouse	Member
18	Manish Patel	Southern Company	Member
19	Alla Deronja	ATC	Guest
20	Mike Detrick	Westinghouse	Guest
21	Genariel Hernandez	Quanta Tech	Guest
22	Miguel Rios	Southern Company	Guest
23	Tim Lensmire	Enercon	Guest
24	Jason Bellamy	Enercon	Guest
25	Sean Black	Fibreband	Guest
26	Bao Pham	Oncor	Guest
27	Matt Black	Sargent & Lundy	Guest
28	Steve Pierce	ECI	Guest
29	Jason Buneo	GE Vernova	Guest
30	Paras Patel	TRC	Guest
31	Neil Saia	Entergy	Guest

C53: Artificial Intelligence / Machine Learning (AI/ML) Data Collection Working Group
Chair: Dan Sabin
Vice Chair: Matthew Reno
Secretary: Mohasinina 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 kickoff meeting of the C53 Working Group meeting convened at 10:42 AM with 25 attendees, 19 of which attended in person. Meeting minutes were recorded by Dan Sabin.

Meeting Discussion
Although the working group's activity is not governed by IEEE Standards Association policy, the working group chair reviewed copyright slides and meeting guidelines and copyright policy provided by IEEE SA, explaining that they are examples of best practices to follow when developing technical reports for PES.

The working group chair provided a summary of the differences between artificial intelligence and machine learning, and then presented the proposed outline of the PES technical report to be developed by the C53 working group. The outline was last discussed in the task force that studied the need to develop the technical report:

- Introduction: Goals, Example Applications, Tradeoffs
- Overview of AI and ML: Existing & Emerging Technologies, Expected Results with Real Data vs Simulated Data
- Data Sets: Data Sources, Data Characteristics, Existing Standards, Data Set Requirements, Time Frames/Sampling Rates, Profiles, Data Set Cleaning, Training, Testing, Application, Integration, Revising, Security of Data Sets, NDAs, Anonymizing
- Example Data Set Platforms: Do-it-Yourself, Complete, Integrated with Existing Applications
- Use Cases: Example Data Set Summaries, Example Data Collection and Labeling Systems, Proactive vs Reactive Action, Model Validation, Links to Online Data (e.g., IEEE DataPort), Online vs Offline Systems
- Future Trends

The attendees discussed the differences between the C53 working group and the proposed C43 working group. C53 will focus on data and data sets, whereas the proposed C43 working group will focus on use cases. The C53 working group should collaborate with the C43 working group, leveraging its work on use cases to give sharper focus on the data sets that should be explored or defined by the C53 working group.

The working group discussed organizing presentations for the next working group meeting timeslot that could present AI applications for data and data sets in protection & control. We had two confirmed volunteers and two possible volunteers. Depending upon the number of presentations, we may need a double timeslot, but will request only a single one for right now.

We discussed revising the proposed report outline at the next meeting after the working group presentations, and then requesting volunteers to begin working on different sections of the report.

We will meet next at the next IEEE PES PSRC meeting in Buffalo.

Adjournment: The meeting adjourned at 11:45 AM.

Attendees:

First Name	Last Name	Company
Ted	Hlibka	Consultant
Alex	Apostolov	OMICRON
Michael	Balestrieri	SCE

Matt	Black	Sargent & Lundy
Milo	Daub	Mesa Associates
Abder	Elandaloussi	SCE
Robert	Fowler	ENTRUST Solutions Group
Yanfeng	Gong	SEL
Joe	Grappé	Sentient Energy
Aboutaleb	Haddadi	EPRI
Muhammad	Hamid	Black & Veatch
Dereje	Hawaz	SEL
Genariel	Hernandez	Quanta Technology
Yi	Hu	Quanta Technology
Byungtae	Jang	KEPCO
Mohasinina	Kamal	SCE
Addis	Kifle	GTC
Nicholas	Kraemer	NuGrid Power
Melvin	Moncey Joseph	Black & Veatch
Dhruv	Patel	Hubbel
Matthew	Reno	Sandia National Labatories
Miguel	Rios	Southern Company
Jose	Ruiz	Doble
Jeff	Wischkaemper	Texas A&M
Karen	Wyszczelski	SEL

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 (New Orleans, LA) and virtually (via WebEX) on January 10, 2024, from 4:10 to 5:25 PM CST.
- 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 present in person
- The meeting was attended by 33 voting members and 42 guests. Quorum was met (33 out of 42).
- Minutes from the September 2023 meeting held in person were approved - motion made by Sebastien Billaut and seconded by Russ Patterson.
- Agenda for the D Subcommittee January 2024 meeting was approved - motion made by Sebastien Billaut and seconded by Chris Walker.

The Chair reviewed items of interest from the Advisory Committee.

- WG Chairs: please send up to date minutes to Chair and VC by Friday, January 19, 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. The other one will be in the PES library.
- Advisory Committee items of interest:
  - Attendance:
    - 256 for PSRC (183 in person, 73 virtual)
    - 44 for PSCCC (34 in person, 10 virtual)
  - Registration prices are increasing
  - Future Meetings
    - May 2024 – Buffalo, NY
    - September 2024 – Scottsdale, AZ
    - JTCM 2025 – Garden Grove, CA
    - May 2025 – TBD (Portland, OR ???)

- Main Committee meeting starts at 7:30 AM

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
Chair: Kevin W. Jones
Vice Chair: Normann Fischer
Secretary: N/A
Output: Tutorial
Established Date: May, 2014
Expected Completion Date: May, 2025
Draft: 1.10
Assignment: Create a tutorial on setting impedance-based power swing blocking and out-of-step tripping functions related to transmission line applications. Specific relay settings examples will be provided. Other methods of detecting out-of-step conditions that exist will be summarized and referenced but will not be discussed in detail.

Attendees: 7 in person and 6 virtual attendees (13-total: 4 members and 9 guests)

- The chair presided over the meeting and started with introductions. The vice-chair was unable to attend.
- Discussion ensued about the joint survey with C29/D29 to query the industry on power swing relay practices. It was decided that the survey effort would take up too much valuable time that would detract from getting the draft documents for both working groups completed, so the survey was abandoned.
- The chair walked attendees through the current draft document. The chair will clean up the first several sections by addressing comments and accepting changes. The chair will also complete section 6 and will complete the examples in section 7. Once cleanup of the first sections has been completed, the chair will share version 1.11 with membership.
- The Chair adjourned the meeting.

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

Attendees:

First	Last	Affiliation	Status
Koustubh	Banerjee	Eversource Energy	G
Jörg	Blumshein	Siemens	VM
David	Busot	Tampa Electric Company	G
Salal	Harmukh	SEL	G
Gene	Henneberg	NVEnergy	VM
Joshua	Hughes	Qualus	G
Jack	Jester	Exelon Corp	G
Kevin	Jones	Xcel Energy	VM
Meyer	Kao	Qualus	VM
Kevin	Malpede	ComEd	G
Christopher	Ness	Megger	G
Juan	Pineros	XM Columbia Power System Operator	G
Periyaandhavar	Sabhari Rajan	PNM at Albuquerque New Mexico	G

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: May 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 and virtually in New Orleans, January 10, 2024 from 10:30 to 11:40 AM with a total of 28 attendees, including 9 members and 19 non-voting members. Thus, a quorum was established. September minutes were approved.

The technical report went to a ballot of the Subcommittee on March 9, 2023. The report was approved, with 33 approval votes. 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.

Old business: WG previously met online on October 20, with 5 voting members. The meeting time was used to go through ballot comments. Similarly, the WG met online on November 3, with 8 voting members. At this meeting, ballot comments were discussed. In addition, the Chair and Vice-Chair met on November 17 and January 2 to incorporate comments and make edits, based on those WG discussions. Approximately 80% of the comments have been reviewed and, in most cases, have been incorporated in the tutorial.

Many technical and editorial comments have been incorporated. The tutorial has not changed substantially, but some ballot comments were made to omit or reduce portions of Sections 3, 4 and 6

since much of these sections deal with relay design specifications that are unique to manufacturers. The WG is addressing this by making some changes to the latest draft:

- Sections 3 and 4 will be retained, but the most detailed information will be moved to the Informative Annex.
- Most of Section 6 is retained, with some changes including: harmonizing Section 6.3 and 6.5 on weak sources and impact of SIR, omitting event analysis in Section 6.4 on faulted phase selection, and adding clarity to Section 6.1 on impact of zero-sequence mutual coupling.
- The WG agreed to meet online to edit several other sections.

A copy of the latest draft, with and without redline will be sent to voting members.

To continue to expedite the reviews, the WG will meet online via Teams or Webex, dates TBD. We will invite WG members and commenters to the online review meetings.

Meeting was adjourned.

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

Attendance:

20240110, Working Group D30 Attendance

Sebastien	Billaut	Commonwealth Associates, Inc	Voting Member	1
Joerg	Blumschein	SIEMENS	Voting Member	1
Ritwik	Chowdhury	SEL	Voting Member	0
Joshua	Lamb	Ameren	Voting Member	1
Van	Le	Western Area Power Administration	Voting Member	1
Ryan	McDaniel	SEL	Voting Member	1
Carolyn	Sun	B&V	Voting Member	1
Christopher	Walker	Mesa Associates, Inc	Voting Member	1
Ted	Warren	Southern Company Services	Vice-Chair	1
Zhiying	Zhang	General Electric Company	Voting Member	0
Karl	Zimmerman	Ameren	Chair	1
				9

Meyer	Kao	Qualus	Non-voting member/guest	1
James	Van de ligt	IEEE Member	Non-voting member/guest	1
Charlie	Henville	IEEE Member	Non-voting member/guest	1
Kevin	Malpede	IEEE Member	Non-voting member/guest	1
Paras	Patel	TRC Companies	Non-voting member/guest	1
Mohammad	Hamid	Black and Veatch	Non-voting member/guest	1
Seth	Barnes	TVA	Non-voting member/guest	1
Christopher	Ness	Megger	Non-voting member/guest	1
Andrew	Nguyen	TVA	Non-voting member/guest	1

Paul	Elkin	EPRO Engineering	Non-voting member/guest	1
Greg	Hataway	Burns and McDonnell	Non-voting member/guest	1
Joshua	Hughes	Qualus	Non-voting member/guest	1
Alex	Portier	Enercon	Non-voting member/guest	1
Henry	Qun	Entergy	Non-voting member/guest	1
stin	Penny	Entergy	Non-voting member/guest	1
Milton	Quinteri	Entergy	Non-voting member/guest	1
Diane	Nguyen	Entergy	Non-voting member/guest	1
Jack	Jester	Exelon Corp	Non-voting member/guest	1
Sajal	Harmukh	IEEE Member	Non-voting member/guest	1

19

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 May 2024.

D35: Evaluation of Transmission Line Pilot Protection Schemes

The WG did not meet. The D35 technical report is complete and is submitted for Subcommittee D balloting. It will be distributed to the SC members in a February-March timeframe for review and approval. The WG is expected to meet in May 2024.

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
Aaron	Findley	POWER Engineers	Voting Member
Tapan	Manna	Burns & McDonnell	Voting Member
Jackie	Wilson	Ameren	Voting Member
Nuwan	Perera	POWER Engineers	Vice-Chair
Van	Le	Western Area Power Administration	Guest
Melvin	Moncey Joseph	Black & Veatch	Secretary
Manish	Das	GE	Guest
Ding	Lin	Manitoba Hydro	Guest
Bernard	Matta	SEL	Guest
Jada	Hawaz	SEL	Guest
Bruno	Freitas	Siemens Energy	Guest
Sergio	Yamazaki	Siemens Energy	Guest
Sachintha	Kariyawasm	POWER Engineers	Guest

D37 met on January 9th 2:20pm CT with 13 people in attendance.
Vice-Chair went through the report draft.
Report will be sent out to members and some guests (Sergio, Jada, Sachintha, Bernard, Ding) who expressed interest for reviewing it fully.
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 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: Greg Ryan

Agenda:

1. Introductions/Sign up sheet/roster
2. Review Working Group Membership and Membership Process
3. Approve previous meeting minutes: first – Ted Warren second – Alla Deronja
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 minutes were approved.

Chris discussed the status of the report. We are working to publish prior to the latest revision of the transmission line guide. The report is to a place where we can begin our working group ballet vote.

Chris reviewed the writing assignments received since our last draft. Ritwick has provided an update to evaluating Zone 1 steady state security. Juan Pineros provided an update to appendix B. Ryan McDaniel reviewed section 3.

Ritwick has provided an overall report review. A cautionary statement review by Don Lukach and Chris Walker will be performed prior to working group balloting.

Draft 1.5 will be sent to the full working group by 1/19/2024.

Cautionary statement review requested to be completed by 2/23/2024 so that the full working group ballot will be sent out on 3/1/2024 and ballot completed on 4/19/2024.

Alla Deronja will review the report for terminology usage and liaison with the I2 working group.

Captured from the chat. from Juan Piñeros - XM to everyone: 2:49 PM
We had a discussion in our national committee in Colombia... All the references, including the Bogdan and Michael papers, support the idea that with SIR between 4 and 10, you can find possible settings that work well. Between 10 and 25, you have to significantly reduce zone 1 if you want proper performance. With SIR >25 or >30, we are now deactivating zone 1. The last case is happening frequently with zone 1 from the relay for the IBR side bay of a line connecting solar or wind generation.

We request a meeting for 40 with projector in May. Please avoid conflicts with D42, D43, & D53.

Attendees: 17 Members, 28 Total

Role	Last Name	First Name	Affiliation
Chair (Voting)	Walker	Christopher	Mesa Associates, Inc
Vice-Chair (Voting)	Ryan	Gregory	Ameren
Voting Member	Barsch	Jeffrey	American Electric Power

Voting Member	Blumschein	Joerg	SIEMENS
Voting Member	Deronja	Alla	American Transmission Company
Voting Member	James	Robert	Pacific Gas & Electric Co.
Voting Member	Jester	Jack	Delmarva Power- Exelon
Voting Member	Lebeau	Daniel	CIMA+
Voting Member	Lewey	Brandon	Ameren
Voting Member	Lukach	Donald	Ameren
Voting Member	Mackie	Bruce	Nashville Electric Service
Voting Member	McDaniel	Ryan	SEL
Voting Member	Mysore	Pratap	Pratap Consulting Services LLC
Voting Member	Pineros	Juan	XM S.A. Colombia Power System Operator
Voting Member	Warren	James	Southern Company Services
Voting Member	Zahid	Abu	Hydro One Network Inc.
Non-Voting Member	Sufana	Charles	Retired
Guest	Davies	Brandon	TRC
Guest	Condra	Tim	TVA
Guest	Barnes	Seth	TVA
Guest	Andy	Kunze	
Guest	Kevin	Malpede	Com Ed
Guest	Jessup	Erin	SEL
Guest	Garauaglia	Lou	G+W Electric Co.
Guest	Quin	Henry	Entergy
Guest	Nguyen	Diane	Entergy
Guest	Penny	Austin	Entergy
Guest	Patel	Paras	TRC

D42: Revise IEEE Std C37.113-2015, IEEE Guide for Protective Relay Applications to Transmission Lines
Minutes for the 01/09/2024 meeting from 9:20 to 10:30 AM CST
Chair: Jeffrey Barsch
Vice Chair: Rick Gamble
Secretary: Josh Lamb
Output: Guide
Established Date: 5/5/2020
Expected Completion Date: 2024
Draft: 2.2
Assignment: Revise IEEE Std C37.113-2015, IEEE Guide for Protective Relay Applications to Transmission Lines

a) Officers presiding – Jeff Barsch and Rick Gamble
b) Officer recording minutes – Rick Gamble
c) Call to order – Jeff Barsch
d) Chair's remarks – Copyright and patent slides presented. No issues identified.
e) Results of call for quorum – Quorum achieved with 24 of 35 voting members

f) Approval of Agenda (motion and second) – Don Lukach 1st, Steve Conrad 2nd.
g) Approval of Minutes of previous meetings (motion and second) – Rafael Garcia 1st, Muhammad Hamid 2nd.
h) Brief summary of discussions and conclusions including any motions.
    a. Worked through list of comments received by WG
        i. A comment for Section 4.4 was made regarding potentially adding a reference to C37.120 section 4.2.
            1. There was also general discussion about the use of section 4.4 in this guide since historically the line guide was the only place for information on zones of protection.
            2. The WG agreed Section 4.4 in scope of Section 4.1 provides fundamental context for the line guide, especially for new users. Therefore, this comment was rejected.
        ii. A comment for Section 4.4 suggesting rewording 'gaps' to 'blind spots' was discussed.
            1. The word 'gaps' has been used in many documents, but 'blind spots' is defined in the bus protection guide. A check needs to be made to see if 'gaps' is defined by IEEE.
            2. Another suggestion was to update the body text or the figures in Section 4.4 to better define what a 'gap' is. See Action Item a. below.
        iii. A comment for Section 6.6.4.5. was submitted to add accuracy and clarity regarding echo tripping in POTT application on multi-terminal lines. The text was revised in the WG meeting.
i) Action items:
    a. Charlie Sufana to work on Figures 5 and 6 in Section 4.4 to add clarity regarding 'overlapping protection' and 'gaps'.
j) Recess and time of final adjournment: Adjourned by Jeff Barsch at 10:30 AM CST.
k) Next in person meeting date and location at: May 2024 in Buffalo, NY at PSRC. Virtual meetings will be held on Thursdays until comments are completed on Thursdays from 11:00 – 12:30 Eastern Time starting January 25th, 2024 as follows:
    a. January 25
    b. February 1
    c. February 8
    d. March 7
    e. March 14
    f. March 21
    g. April 4
    h. April 11
    i. April 18
    j. April 25
    k. May 2

Attendee	**Affiliation**
Jeff Barsch	AEP
Milton Quinteros	Entergy
Jack Fital	Entergy
Don Lukach	Ameren
Jim O'Brien	Duke Energy

Steve Conrad	Retired
Daniel Lebeau	Hydro Quebec
Andy Kunze	Minnesota Power
Ryan McDaniel	SEL
Kamal Garg	SEL
Sebastien Billaut	Commonwealth Associates
Rafael Garcia	Oncor
Ted Warren	Southern Company
Brandon Lewey	Ameren
Mat Garver	BECO
Ritwik Chowdhury	SEL
Greg Hartaway	Burns & McDonnell
Abu Zahid	Hydro One
Melvin Moncey Joseph	Black & Veatch
Alla Deronja	ATC
Ian Tualla	Duke Energy
Arun Shrestha	SEL
Scott Elling	Burns & McDonnell
Carolina Arbona	Burns & McDonnell
Meredith Werley	Duke Energy
Ethan Grindle	ATC
Seth Barnes	TVA
Tim Condra	TVA
Muhammad Hamid	Black & Veatch
Charlie Sufana	Retired
Jorg Blumschein	Siemens
Bruce Mackie	Nashville Electric Service
Chris Walker	Mesa Associates
Juan Pineros	XM S.A. Colombia Power System Operator
Rick Gamble	TVA

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: 2.2

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.

IEEE PES PSRC WG D45 Meeting Minutes Jan 2024

Working Group D43 met in-person on January 10, 2024, at 08:00-09:10AM CST. There were total of 13 attendees (5 members and 8 guests or non-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 introduction of in-person and remote attendees (10 people attended in person, 2 remote). 5 voting members (out of 9) were present in the meeting.
- The team went through the remaining/final comments and approved the changes.
- Version 2.2 of the report was finalized in the meeting, to be voted on.
- Don L. took the motion to vote, and Josh H. seconded.
- 5 members voted yes (4 in-person + 1 remote).
- Greg (chair) will send the final report (v2.2) to the remaining four members and will ask for their vote (75% acceptance is required)
- Once the approval is obtained, the report will be sent to D-SC chair for sharing with D-SC members and/or officers for review.
- The meeting was adjourned at 09:02AM.

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)	Greg Ryan	Ameren
2)	Amin Zamani	Quanta Technology
3)	Joshua Hughes	Qualus
4)	Meyer Kao	Qualus
5)	Jackie Wilson	Ameren
6)	Don Lukach	Ameren
7)	Juan Gers	GERS USA
8)	Juan Flores	PSEG
9)	Milo Daub	Mesa Associates
10)	Jack Jester	Exelon
11)	Paul Harris	PcifiCorp
12)	Mark McChesney	Oncore
13)	Brittany Wagner	Delaware Electric Co

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: 3.1.2
Assignment: Revise IEEE Std C37.114-2014, IEEE Guide for Determining Fault Location on AC Transmission and Distribution Lines

Working group D44 met on January 10, 2024, at 9:20 PM CST, Hybrid with **21 attendees.**

10 voting members were present out of **21** 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 and Secretary Looja Tuladhar recorded minutes.

The Chair presented the latest change to the draft approved by WG for balloting.

The WG will make a motion to the PSRC subcommittee D to authorize the creation of a balloting body by initiating the invitation process and sending draft 3.1.2 of C37.114 IEEE Guide for Determining Fault Location on AC Transmission and Distribution Lines to IEEE SA

For the next face-to-face, we will need a projector and a room for 30. Avoid conflict with C38, D30, D35, D38, D42, K22, K27, and K29.

Meeting Attendees

First Name	Last Name	Company Name	Role
Sebastien	Billaut	Commonwealth Associates, Inc	Chair
Looja	Tuladhar	Daymark Energy Advisors	Secretary
Karl	Zimmerman	Ameren	Vice-Chair
Bruce	Mackie	Nashville Electric Service	Voting Member
Daniel	Sabin	Schneider Electric	Voting Member
Brian	Boysen	WEC Energy Group	Voting Member
Joerg	Blumschein	SIEMENS	Voting Member
Robert	James	Pacific Gas & Electric Co.	Voting Member
Ryan	McDaniel	SEL	Guest
Clair	Patti	PGE	Guest
Hugh	Burland	Burland DES/Anseris IQ	Guest

Louis	Garavaglia	G&W Electric co	Guest
Malia	Zaman	IEEE SA	Guest
Swagata	Das	Schweitzer Engineering Laboratories	Voting Member
Byungtae	Jang		Guest
Yanfeng	Gong	SEL	Guest
Theo	Laughner	Lifescale Analytics	Voting Member
Fredy	Bravo	Duke Energy	Guest
Alexis	Mezco	TRC	Guest
Jada	Hawaz	SEL	Guest
PSRC	Committee		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 (1st task force meeting)
Expected Completion Date: May 2024
Draft: Initial Draft (with edits)
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 1/09/24 at 3:40pm (Central USA Time)
Members = will be adjusted based on attendance and participation
Attendance = 37 - 26 in room, 11 WebEx, 20 guests, 17 Voting Members (of 20) – Quorum Established

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, Sep 2023 (minutes approved)
- introduced the initial very rough draft and initiated a discussion about the status of each section from the team leads. Initial draft is approximately 40 pages.
- leads were given action items and will modify the section per the comments discussed. Comments are included in the first draft. With Additional comments:
  - Section 3 - Fault Behavior and Ignition Risks - Robbie James - needs minor cleanup
  - Section 4 - Conventional Relay Setting Changes Methods – Matt Garver - has sent some updates via email
  - Section 4B - Communications Aided Protection Methods – Russ Patterson - will reduce content to include high level summary, add discussion on distribution differential (Provide by Bogdan Kasztenny)
  - Section 5 - HIF/HIZ Algorithms based on High Frequency Detection Methods - Dan Ransom - needs to be made generic and inclusive of various techniques, consider adding "down conductor" reference
  - Ground Current Pulse Counting Methods – Scott Hayes - needs 2nd set of eyes (Boris Marendic) to review, consider adding this to section 5

- Section 6 - Grounding Systems Methods – Hugh Borland - will reduce content. This subject is covered in another WG. Keep discussion about different grounding methods compensation neutrals including coordination and fire risks, applicable to ungrounded systems, discuss resistance in neutrals. Ritwik Chowdhury to send information to Hugh Borland
- Section 7 added to grounding systems section 6
- Section 8 - Incipient Fault Detection Methods – Nirmal Nair - needs minor review and edits, verify sensors/spot sensor discussion, will add discussion on Traveling Wave and fiber optic methods
- Open Phase/Wire Down Detection Methods – Eric Udren - provided a condensed version, move to section 4B above
- Section 9 - Impact on Fault Behavior (fault energy) – Daqing Hou – Scott will lead a discussion with increased focus on fusing for non-expulsion or current limiting fuses, risk of back feed (Daqing), need generic discussion of Fault Tamer (programmable fuses)
- Consider adding: capacitor balancing for loss of phases (may be part of compensated neutrals), IBR impact and bidirectional flow issues (add to scope or section 3), consider discussion about service entrance issues, Mike Meisinger will add references and cites as needed

For the next meeting, D45 will need a room for 40 and a computer projector.
Title needs to be changed on Conference Agenda: "Protection Methods to Reduce Wildfire Risks".

Attendance

Membership/Roster	**S3**	**J4**	**status**	**Guests 1/9/24**
1. Jonathan Sykes Chair	x	x	m	Kamal Garg
2. Scott Hayes Vice Chair	x	x	m	Mike Ramlachan
3. Hasan Bayat			nvm	Alyssa Bender
4. Hugh Borland	x	x	m	Paul Nichols

5.	Ritwik Chowdhury	x	x	m	Justin Turner
6.	Normann Fischer		x	m	Fredy Bravo
7.	Matt Garver	x		m	Mohasinian Kamal
8.	Ramakrishna Gokarju			nvm	Maziar Isapour
9.	Wayne Hartman			nvm	Mark McChesrey
10.	Daqing Hou	x	x	m	Abu Zahid
11.	Ying Hu			guest	Lou Garavaglia
12.	Robbie James	x	x	m	Paul Harris
13.	Yuan Liao			guest	Mike Meisinger
14.	Bruce Mackie		x	m	Diane Nguyen
15.	Mehrdad Majidi			nvm	Jackie wilson
16.	Deepak Maragal		x	m	Matthew Reno Sandia
17.	Boris Marendic			nvm	Raluca Lascu
18.	Tony Marxsen			nvm	Dhruv Patel
19.	Nirmal Nair		x	m	Robert Fowler
20.	Madhab Paudel			nvm	David Caverly
21.	Russ Patterson	x	x	m	
22.	Henry Quin		x	m	
23.	Dan Ransom	x	x	m	
24.	Charlie Sulfana			nvm	
25.	Douglas Taylor	x		m	
26.	Eric Udren	x	x	m	
27.	Ari Wahlroos			m	
28.	Joe Xavier			m	
29.	Yujie Yin		x	m	
30.	Amin Zamani	x		m	

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

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: 6.0
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 24 voting members, 5 non-voting members, and 16 guests on Wednesday, January 10, 2024, at the JTCM January 2024 meeting. One guest joined the WG as a voting member.

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 met, so the WG voted to approve the PSRC September 20, October 23, and December 18, all 2023, webex meeting minutes. Motion: Chris Walker, 2nd: Joerg Blumschein.

The meeting agenda was approved. Motion: Ken Fodero, 2nd: Tom Dahlin.

The Chair reviewed the present status of the guide revision. Most of the initial WG member comments have been addressed. Clause 6 *Communication channels* is getting close to completion.

Based on the made progress, the Chair proposed to have a couple of monthly Webex meetings in January and February of 2024. The guide may be ready for the WG ballot by March 1, 2024.

The chair needed more help with redrawing of the figures. Ken Fodero volunteered to help Abu Zahid, our designated figure manager, to complete the task. Thank you very much both, Abu and Ken!

The WG proceeded to address the technical topics that arose during the winter 2023 webex meetings.

Previously, there was a question about whether it is communication channel “switchover” or “failover”. The WG agreed at the September meeting to use “failover”. However, an objection was made that “switchover” is rather to be used as addressing a complete communication system for redundancy considerations. Switchover happens in the network. Failover rather refers to the relay when it senses a communication issue and makes failover to a hot standby/redundant channel. The consensus was reached to use “switchover” in the guide.

An issue to address LCD relay different vendor relay communications since the IEC 61850 allows communicating two LCD relays of different vendors is settled as it is addressed in 6.4.3 *Interoperability*.

The WG also settled on the multiplexed channel definition by combining a part of the previously proposed and the newly proposed renderings to be as follows: A time-division multiplexed channel as depicted in Figure 7 is a set of dedicated channels and provides independent data flows between separate transmitter/receiver pairs in the same direction sharing a single communication medium.

In 6.2.5.3.1 IP/MPLS, a paragraph describing a detailed difference between MPLS and IP was deemed unnecessarily and agreed to be removed.

The WG revisited some of the common communication-related terms utilized in the guide that are not consistent.

Communication channel vs communications channel.
Per the Dec. 18 webex meeting discussion, this is very subjective. A suggestion was to discriminate based on the type of a channel. A point-to-point, dedicated channel with unshared bandwidth like dedicated fiber or SONET/SDH where each timeslot is dedicated can be referred to as a communication channel. On the other hand, communications channel is point-to-multipoint with shared bandwidth like Ethernet. However, what if the text is about a communication channel in general? Communications

channel may be used in this case since this term encompasses both channel types with non-shared and shared bandwidths. Word “communications” is a reference to the technology. One member stated that, grammatically, when used as an adjective in conjunction with a following noun, the preceding noun should be used in a singular form, not plural; hence it is a communication channel, not a communications channel.

Ken Fodero made a motion to use “communication channel” as generically applicable to all instances. Joerg Blumschein seconded. The motion passed with 14 WG voting members in support, 2 opposed, and 2 abstained.

Ritwik Chowdhury made a motion to use “communication” in all instances where it is used in conjunction with “channel”, “system”, “link”, etc. Tom Dahlin seconded the motion. It passed with 18 WG voting members in support and 1 opposed.

The meeting was adjourned with Chris Walker motioned to adjourn it and Ken Fodero 2nded.

Action Items:

1. **Galina, Steve, Alla, and Chris** will review 6.0 *Communication channels*. Ongoing.
2. **Austin Wide** will review 6.3.5 *Interoperability*. Requested due date: August 15, 2023.
3. **Galina Antonova** will provide a figure for 6.2.4.2 *Layer 2 bridges and Layer 3 switches and routers.* Requested due date: September 15, 2023.
4. **Galina Antonova** will check the accuracy of Figure 11 in 6.2.4.3 *MPLS.* Requested due date: September 15, 2023.
5. **Milton Quinteros** will add a few statements as related to utilizing the LCD for autotransformer protection to 7.18.2. Requested due date: November 20, 2023.

Outstanding Action Items:

1. The following WG members will verify delay variations (both jitter (fast) and wander (slow) with requested due date: June 10, 2023.
    a. **Mike Kockott** for the Hitachi relays.
    b. **Andre Mello** for the Schneider Electric relays.

We request a meeting at the January JTCM 2024 meeting with a room for 40 and a projector. Please avoid conflicts with C48, K31, D42, C52, and I2.

Meeting Attendees

Role	First Name	Last Name	Affiliation
Guest	Scott	Cooper	OMICRON
Guest	Normann	Fischer	SEL
Guest	Rafael	Garcia	Oncor Electric Delivery
Guest	Gene	Henneberg	NV Energy
Guest	Byungtae	Jang	KEPCO
Guest	Van	Le	Western Area Power Administration
Guest	Daniel	Lebeau	Hydro Quebec
Guest	Matthew	Leyba	GE
Guest	Bernard	Matta	SEL

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Guest	Soon-Ryul	Nam	Myongji University
Guest	Juan	Piñeros - XM	XM S.A. Colombia Power System Operator
Guest	Jun	Versosa	Doble Engineering
Guest	Diane	Nguyen	Entergy
Guest	Henry H	Quin	Entergy
Guest	Lin	Shi	GE Vernova
Non-Voting Member	Chikashi	Komatsu	Hitachi, Ltd
Non-Voting Member	Kevin	Malpede	ComEd
Non-Voting Member	Ryan	McDaniel	Schweitzer Engineering Laboratories
Non-Voting Member	Milton	Quinteros	Entergy
Non-Voting Member	Neil	Saia	Entergy
Guest	Sebastien	Billaut	Commonwealth Associates, Inc
Voting Member	Joerg	Blumschein	SIEMENS
Voting Member	Ritwik	Chowdhury	Schweitzer Engineering Laboratories, Inc.
Voting Member	Tom	Dahlin	Schweitzer Engineering Laboratories
Voting Member	Ken	Fodero	Schweitzer Engineering Laboratories, Inc.
Voting Member	Kamal	Garg	Schweitzer Engineering Laboratories, Inc.
Voting Member	Dinesh	Gurusinghe	RTDS Technologies Inc.
Voting Member	Chris	Huntley	Schweitzer Engineering Laboratories, Inc.
Voting Member	Bruce	Mackie	Nashville Electric Service
Voting Member	Hugo Alexis	Mezco	TRC
Voting Member	Melvin	Moncey Joseph	Black & Veatch
Voting Member	Gayle	Nelms	Schweitzer Engineering Laboratories, Inc.
Voting Member	James	O'Brien	Duke Energy
Voting Member	Paras	Patel	TRC
Voting Member	Taylor	Raffield	Duke Energy
Voting Member	Arun	Shrestha	Schweitzer Engineering Laboratories, Inc.
Voting Member	Tuan Anh	Tran	TVA
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	Karl	Zimmerman	Ameren
Voting Member/Chair	Alla	Deronja	ATC
Voting Member/Secretary	Galina	Antonova	Hitachi ABB Powergrids

Old Business

Webex meeting #15

The WG D47 met with 8 voting members and 2 non-voting members on Monday, December 18, 2023, in webex meeting #15 to continue reviewing the guide material and resolving initial comments received from the WG members for the on-going guide's revision.

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.

The quorum (needed 18 voting members) was not met.

This work is a joint project between the PSRC leading the project and PSCCC co-sponsoring it.

The Chair reviewed the present status of the guide revision. Most of the initial WG member comments were addressed. Clause 6 *Communication channels* is still under development, and a WG sub-team is working on it incorporating the comments from a PSCCC SME member.

At this Webex, the WG reviewed the common communications-related terms utilized in the guide that are not consistent. The PSCCC Terminology WG A8 chair was contacted and provided the definitions for the terms from the IEEE Standards Dictionary if available and his recommendations on what we should use.

1. Communication channel vs. communications channel
Both definitions are available in the dictionary, and the recommendation is to use the existing term that matches the context. It is, however, very subjective. One suggestion was to discriminate based on the type of a channel. A point-to-point, dedicated channel with unshared bandwidth like dedicated fiber or SONET/SDH where each timeslot is dedicated can be referred to as communication channel. On the other hand, communications channel is point-to-multipoint with shared bandwidth like Ethernet. It is a very good suggestion. However, what if the text is about a communication channel in general? Communications channel may be used in this case since this term encompasses both channel types with non-shared and shared bandwidths.

2. Communication link vs. communications link
A link is synonymous to media. There are no current definitions registered in IEEE Standards Dictionary for these word pairs. However, there are several definitions for "link". There were few instances of using "communication link" and "communications link" in the document. The WG eliminated most of them leaving the ones related to PTP (Precision Time Protocol) in 6.2.5.7 *Time distribution PTP* and based on IEEE Std. 1588.

3. Telecommunication link vs. telecommunications link
These terms have been eliminated from the guide during revision, so they no longer present an issue.

4. Communication system vs. communications system
There is a definition for communications system in the IEEE Standards Dictionary. The recommendation is to use the existing definition found in C37.90.1-2012: Any system which transfers protection or other data to or from the relay interface to or from another location. The WG agreed to use *communications system* throughout the guide.

5. Communication network vs. communications network
There are no current definitions registered in IEEE Standards Dictionary for these word pairs. There is a

definition for communications networking device: An intelligent electronic device (IED) that is an element of a communications network. Recommendation was to create a new definition for "communications network" for consistency with this reference. Note that IEC uses "communication networks". 16 instances of communication network(s) and 4 instances of communications network(s) are in the guide. We may need to engage our I2 liaison and discuss with the whole WG.

6. Communication vs. communications

Communication is defined as: The act of conveying a message from a transmitting party to a receiving party. No definition for communications. If used on its own, should we generally use communications?

7. Communication interface vs. communications interface

No definition for communication interface. The definition for communications interface does not sound correct: An intelligent electronic device's (IED) communications interface supports centralized monitoring and control for overall time distribution system management. In the guide, there are 3 instances of communication interface and 2 of communications interface. No decision. We may need to engage our I2 liaison and discuss with the whole WG.

In the remaining time, the WG addressed some topics prepared for the upcoming January 2024 WG meeting at JTCM.

- A new subclause 6.2.2 *Physical media* was tentatively added to the guide to provide brief descriptions for existing and newer communication channel media (copper, fiber, wireless, etc.). It was thought to be beneficial for protection engineers. There were seemingly no objections to this subclause. The upcoming WG ballot will help to determine the WG acceptance of it.
- It was a question whether we should add material to 6.2.3.3 *Microwave* like advantages of this communication media as the subclause is very short. The WG agreed not to proceed in this direction as it would necessitate adding pros and cons to other technologies that may opinionate the material by the authors vs. documenting available technologies.
- There are two renderings for a multiplexed channel term in 6.2.1 *General*. Which one should we keep? Thomas R. thought both are incomplete and should be combined. He volunteered to look at it.
- Should we use a switched or packet-switched communication channel term in the document? Packet-switched technology is the most common but not the only one. The WG agreed to use a more general term (switched communication channel).

Next meeting is scheduled for January 10 at JTCM 2024.

Meeting Attendees

Role	First Name	Last Name	Affiliation
Non-Voting Member	Chikashi	Komatsu	Hitachi, Ltd
Non-Voting Member	Neil	Saia	Entergy
Voting Member	Tom	Dahlin	Schweitzer Engineering Laboratories
Voting Member	Gayle	Nelms	Schweitzer Engineering Laboratories, Inc.
Voting Member	James	O'Brien	Duke Energy
Voting Member	Taylor	Raffield	Duke Energy
Voting Member	Austin	Wade	SEL

Voting Member/Chair	Alla	Deronja	ATC
Voting Member	Qun	Qiu	AEP
Voting Member	Thomas	Rudolph	Schneider Electric GmbH

Webex meeting #14

The WG D47 met with 12 voting members and 5 non-voting members on Monday, October 23, 2023, in webex meeting #14 to continue reviewing the guide material and resolving initial comments received from the WG members for the on-going guide's revision.

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.

The quorum (needed 18 voting members) was not met.

This work is a joint project between the PSRC leading the project and PSCCC co-sponsoring it.

The Chair reviewed the present status of the guide revision. Most of the initial WG member comments were addressed. Clause 6 *Communication channels* is still under development, and the WG leadership is working on it incorporating the comments from a PSCCC SME member. An invitation was made to any WG members who are strong in both protection and communication aspects of LCD to join the subgroup and help finalize the clause.

At this Webex, the WG reviewed remaining comments for other clauses of the document.

Some highlights of the technical items addressed at this meeting are following:

- Pseudowire

According to 61850 technical report 90-12, pseudowire is an emulation of a direct, not-shared wire with constraint latency using PSN (packet-switched network). Should a definition for pseudowire be introduced in the guide? It is not available in the IEEE Standards Dictionary. It is used in other technologies like C37.94.

Some WG members did not like the term; however, it may have to be used as part of a pseudowired multiplexing (SONET/SDH) technology that apparently falls under the switched communication channel category. The 61850 definition was slightly modified to read: Pseudowire is an emulation of a direct, not-shared, point-to-point wire with constraint latency using switched communications. It will be included in a subclause dealing with the pseudowired multiplex technology.

- Multi-phase autoreclosing

A comment was made that 7.15 *Multi-phase autoreclosing* duplicates 7.4 *Multi-phase tripping and autoreclosing* in C37.104 *IEEE Guide for Automatic Reclosing on AC Distribution and Transmission Lines.* The WG compared the material and disagreed there was a duplication. Subclause 7.15 documents this feature of LCD and does not duplicate C37.104.

- In-line transformer: duplication of C37.113?

A comment was made that 7.18.2 *In-line transformer* duplicates 5.5 *Lines terminated into transformers* in C37.113 *IEEE Guide for Protective Relay Applications to Transmission Lines.* It was compared with the material written in the line guide and found to be quite similar. However, the WG agreed to keep the subclause as is because this is another feature of LCD. A question was brought concerning applying LCD for lines with autotransformers. A couple of sentences may be contributed to be included in the guide to that effect.

- Annex with an example to demonstrate how to properly set and apply 87L relays

Feedback from the potential authors for this Annex has been that its creation with an example to demonstrate how to set and apply 87L relays may be complicated because different vendors may have very different settings. An option was entertained to develop a few examples, one for percentage-restrained, another for alpha plane, and another for charge comparison LCD methods. However, the WG felt that the users should always refer to vendors' manuals on how to set the LCD relays as these manuals typically contain detailed examples. Additionally, examples in the guide may distract the readers from consulting the manuals. It was decided not to develop the Annex at this time.

- Analog signal's digitalization process

This education material was previously removed from one of the subclauses and suggested to be in an Annex. This material may be applicable to all microprocessor relays, how they digitize data, and can be too generic to be included in this guide although 64kbps channel is used with LCD. Ultimately, the WG decided not to include it in the guide.

The WG reviewed some of the contents of clause 6 *Communication channels*. Specifically, a discussion ensued relative to 6.1.5 *Redundancy* that described redundancy requirements for relay communication paths (6.1.5.1) and communication channels (6.1.5.2). The WG members tried to understand the difference between the two and suggested a diagram to be added for clarification. The point was received; however, it was agreed to not make any changes at this time because the whole Clause should be read and understood before making major revisions besides the ones already made.

Next webex meeting (#15) is scheduled for November 20, 2023.

Meeting Attendees

Role	First Name	Last Name	Affiliation
Non-Voting Member	Chikashi	Komatsu	Hitachi, Ltd
Voting Member	Gayle	Nelms	Schweitzer Engineering Laboratories, Inc.
Voting Member	James	O'Brien	Duke Energy
Voting Member/Chair	Alla	Deronja	ATC
Voting Member	Qun	Qiu	AEP
Voting Member	Thomas	Rudolph	Schneider Electric GmbH
Non-Voting Member	Kevin	Malpede	ComEd
Non-Voting Member	Milton	Quinteros	Entergy
Voting Member	Joerg	Blumschein	SIEMENS
Voting Member	Melvin	Moncey Joseph	Black & Veatch

Voting Member	Ian	Tualla	Duke Energy
Voting Member	Donald	Ware	Qualus
Non-Voting Member	Alex	Lee	AEP
Non-Voting Member	Xavier	Manel-la Pujol	Siemens
Voting Member	Sudarshan	Byreddy	Burns & McDonnell
Voting Member/I2 Liaison	Matthew	Black	Sargent & Lundy
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 2024
Draft: V4.1 Jan 10, 2024

PSRC D48

Date: Wednesday, Jan 10, 2024
Time: 10:40 – 11:50 AM (CST)

Venue: JTCM, New Orleans, LA

1. Total 35 people (16 remote + 19 in person). Quorum was not achieved hence minutes will be sent for approval via email.
2. Kamal gave overview of sections and progress.
3. SPTR section discussed near IBRs – Ilia, Daniel, Mukesh – Good discussion – WG finalized the paragraph to be added.
4. Mukesh presented-Presentation attached)- 500kV lines almost simultaneous fault and SPT/3PT and almost blackout. Good discussion.
5. Cross-country faults discussion lead by Ilia Voloh. Follow up meeting with Ritwik and Normann to review the comments and finalize the section.
6. Daqing Hou presented proposed changes section 8, moving 8.4, 8.5 and 8.6 into separate section. WG agreed.
7. Fernando discussed briefly about BF and pole discrepancy. K31 BF guide in final stages to finalize BF section. No comments.
8. From previous meeting, outstanding item. Joerg to provide writeup on SPT on three terminal lines. Kamal and Ilia to have follow up meeting with Joerg to finalize this and section 7.0 also.
9. Short discussion about Manitoba Hydro writeup. Kamal and Ilia to work with Ding and Waruna (MH) to finalize this section.
10. Hoping to get first draft ready in 4-5 months.

11. Expecting one virtual meeting before May meeting, if enough progress on the draft.
12. 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	Klecker
Gary	Kobet		Qun	Qiu
Joerg	Blumschein		Abu	Bapary
Mike	Kockott		Daqing	Hou
Fernando	Calero		Ding	Lin

Non-Voting Members

David	Jacobson		Waruna	Chandrasena
Davis	Erwin			

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

The WG did not meet.

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: 1.4
Assignment: To develop a Technical Report to Single Phase Tripping and Reclosing of Distribution Lines.

Presiding Officer: Brian Boysen
Minutes Recorded by: Sudarshan Byreddy

Agenda:
1. Introductions
2. Review September Meeting Minutes
3. Review Outline and discuss any additions
4. Solicit Volunteers
    - Reference Search for papers, reports, etc. related to Single Phase Tripping and Reclosing of Distribution Lines
5. Report overview & discussion – Brian Boysen

Minutes:
- The D51 Working Group met at 1:00PM on 1/9/24.
- There were **17** people in attendance (13 Members and 4 Guests; see below).
- Meeting minutes from the September meeting were reviewed.
- Outline was reviewed.
- Brian Boysen presented an incident on Substation imbalance.
- Section 4.6 and new subsection in 3.1 (discussing keeping residual ground enabled) were reviewed by the WG.
- Assignment progress for various sections:
    - 1.0 Introduction – Brian Boysen (Assignment completed)
    - 2.0 Benefits and Reliability – Swagata Das and Kamal Garg (Assignment completed)
    - 2.2 Other Benefits – Swagata Das & Brittany Wagner Volunteered for the write up.
    - 3.1 Ground Fault Protection – Greg Ryan and Brian Boysen (Assignment completed)
        - Brittany Wagner volunteered to add discussion for leaving residual ground enabled and change operating mode during high load conditions
    - 3.2 Directional Settings – Paul Harris & Brittany Wagner Volunteered for the write up.
    - 3.3 Coordination with upstream and downstream 3ph devices - Sudarshan Byreddy and Jack Jester (Assignment completed) Jack Jester assignment on adaptive settings for 1PT-1LO completed, moved to section 4.3.
    - 3.4 Hot Line Work / Arc Flash –Craig Holt and Brian Boysen. (Completed)

- 4.1 Three Phase Customer Loads – Don Lukach and Bruch Makie (Assignment completed)
- 4.2 DA – Aroundai Chanda and Greg Ryan (pending Assignment)
- 4.3 Phase Load Unbalance – Brian Boysen, Don Lukach, and Jack Jester (Assignment completed)
- 4.4 Delta Connected Transformers and Capacitors – Adi Mulwarman and Brian Boysen (Assignment completed)
- 4.5 Fallen Conductors – Kamal Garg and Brian Boysen (pending Assignment)
- 4.6 Substation Imbalance – Brian Boysen - Completed
- 4.7 DER – Greg Ryan and Muhammad Hamid volunteered (pending Assignment)
- 4.8 Operational Considerations – Paul Harris and Daqing Hou v (pending assignment)

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

Meeting Attendance for the 1/9/24 WG meeting is listed below:

First Name	Last Name	Affiliation	M/G
Brian	Boysen	We Energies	M
Fredy	Bravo	Duke Energy	M
Sudarshan	Byreddy	Burns and Mac	M
Swagata	Das	SEL	M
Kamal	Garg	SEL	M
Paul	Harris	Pacificorp	M
Daqing	Hou	SEL	M
Jack	Jester	Exelon	M
Meyer	Kao	Qualis	M
Don	Lukach	Ameren	M
Bruce	Mackie	Northern Arizona University	M
Greg	Ryan	Ameren	M
Brittany	Wagner	Deleare CoOp	M
Gene	Henneberg	NV Energy	G
Robert	James	PG&E	G
Clay	Stocklin	Power Engineering	G
Jackie	Wilson	Ameren	G

DTF52: Task Force on investigating forming a Working Group on "Line Protection based on Transient Quantities"
Meeting Minutes (DTF52)
January 9, 2024
Hybrid Meeting

Chair: Normann Fischer
Vice Chair: NA

Output: Determine to form a working group
Established: January 2024
Status: WG

Assignment:
Determine whether to form a working group that will investigate transient based quantity line protection.

Attendance:
Total 27 (17 in person, 10 on line)

Overview:

- The chair presented some slides that described the basic principles of transient quantity protection and showed some real-world examples of where transient based line protection is being currently applied.
- It was decided that that one further TF meeting should be held before a final decision is made.
- Professor Sukumar Brahma from Clemson University volunteered to do a presentation at the next TF meeting.

Requirements for next Meeting:
For the next meeting, (in person meeting only), a room for 30 people and an overhead projector.

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/Sign-up sheet
14. Review the assignment
15. Review previous report
16. Request volunteers for sections of survey
17. Discussion of next steps
18. Adjourn

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Minutes:

- Introductions were made and the sign-up sheet was passed around. Anyone who wants to become a Member of the Working Group was asked to identify on the sign-up sheet and/or online chat.
- There were 11 Members and 6 Guests in attendance. Attendance roster is provided below.
- The group discussed tools and methods for conducting the survey. It was noted that Andre Uribe and/or Scott Hayes could be contacted for surveys used previously by PSRC. Steve Car from the T&D subcommittee also noted that their reliability working group has experience with industry surveys as well.
    - Muhammad Hamid will follow up on providing more specifics on survey tools that could be used for this survey.
- The group discussed that it would be helpful to review the specific survey questions from the previous distribution protection practices survey and report issued in 2002. The specific survey questions were not immediately available. Brian Boysen has talked with Pat Carroll who was the chair when the last survey was completed. Pat has a hard copy of the survey questions.
    - Brian Boysen will obtain the last survey questions from Pat Carroll and convert them into a pdf and word format and send them to WG Members for review prior to the next WG Meeting.
- Each Section of the 2002 Survey report was reviewed. Due to time constraints; only the first three sections were reviewed and discussed by the WG in detail; the other sections were only briefly discussed. The WG agreed that the previous survey sections still made sense for the new survey with perhaps additional / new sections to be determined at future WG Meetings.
- D53 plans to meet at the PSRC meeting in May and requests a room for 30 with a projector. Please avoid conflicts with C52, D38, D42, D43 & D51.

1/9/24 D53 WG Meeting Attendance Roster

	Role	**Name**	**Affiliation**
Chair	Voting Member	Muhammad Hamid	Black and Veatch
Secretary	Voting Member	Brian Boysen	We Energies
Vice-Chair	Voting Member	Greg Ryan	Ameren
	Voting Member	Bernard Matta	SEL
	Voting Member	Carolyn Sun	Black and Veatch
	Voting Member	Charlie Sufana	Retired
	Voting Member	Daniel Lebeau	Hydro Quebec
	Voting Member	Paul Harris	Pacificorp
	Voting Member	Robert James	PG&E
	Voting Member	Swagata Das	SEL
	Voting Member	Xiangyu Ding	S&C
	Guest	Bruce Mackie	Northern Arizona University
	Guest	Byungtae Jang	?
	Guest	Daniel Ransom	GE
	Guest	Meyer Kao	Qualus

Guest	Scott Hayes	PG&E
Guest	Steve Parr	Entrustol

DTF54: Evaluate creation of a report on protection methods utilized on compensated neutral grounded distribution systems.

Chair: Russ Patterson
Vice Chair: N/A
Secretary: N/A
Output: Recommendations from task force to the subcommittee.
Assignment: Assess interest in producing a report to the subcommittee on protection methods used on compensated neutral grounded distribution systems.
Attendees: 8 in person attendees as listed below with affiliations (met 1/9/2024).

Meyer Kao (Qualus)
Sudarshan Byreddy (Burns & McDonnel)
Paul Harris (Pacificorp)
Yangfeng Gong (SEL)
Hugh Borland (Anseris IQ)
Brian Boysen (WEC Energy Group)
Muhammad Hamid (Black & Veatch)
Russ Patterson (Qualus)

The chair gave a presentation briefly describing various grounding methods used in distribution systems and then specifically methods used on non-four-wire multi-grounded systems. The focus being on compensated neutral systems.
Next, we discussed ground fault protection methods that are used on compensated systems to detect faults and to support fault location. We also discussed relative energies delivered to faults between the different grounding methodologies (isolated neutral, compensated neutral, resistive earthed neutral, and 4-wire multi-earthed neutral) as well as the “faulted phase earthing” approach that grounds the faulted phase at the substation to shunt energy away from the downstream fault point.
The group agreed that a PSRC report on these topics would be beneficial and recommends that DTF54 become a working group. If approved, we tentatively recommend that our name and assignment be as given below.
Proposed WG name: Protection methods for non-effectively grounded distribution systems.
Proposed WG assignment: Develop a report describing protection and fault location methods in use on non-effectively grounded and compensated grounded distribution systems.

DTF55: Protection of HVDC systems and dc distribution systems

Minutes for the 01/10/2024 meeting from 9:20-10:30 CST
Chair: Brandon Lewey
Vice Chair: Not Required for TR (Nuwan Perera is assisting with Minutes and Attendance)
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: New Orleans, LA

Formalities:

- The TF met on 01/10/2024.
- 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 30 members.

- Summary of discussions and conclusions:
  - TF requested training on this topic to PSRC.
    - Contact information was exchanged for potential presenters.
    - TF requested virtual meetings before May for presentations.
  - Possibility of splitting this TF into two (one for HVDC and another for DC Distribution)
  - Schedule:
    - One presentation in March, April and May PSRCG
- **Action Items**:
  - Chair will coordinate and arrange presentations on various topics.
- WG Adjourned at 10:30 CST

Next Meeting Date: May 2024
Next Meeting Location: Buffalo, NY
Next Meeting Requirements: virtual option with room big enough for 40
Avoid Conflicts with: D38, D35, D42, D47, C41, & K25

First Name	Last Name	Affiliation
Abu	Zahid	
Ding	Lin	Manitoba Hydro
Evangelos	Farantatos	EPRI
Geraint	Chaffey	Katholieke University
Jackie	Wilson	Ameren
Josh	Lamb	Ameren
Taylor	Raffield	Duke
Sajal	Harmukh	
Sebastien	Billaut	
Van	Le	WAPA
Byungtae	Jang	
Nuwan	Perera	Power Engineers
Brandon	Lewey	Ameren
Melvin	Moncy	Black and Veatch
Meyer	Kio	Qualus
Aboutaleb	Haddadi	EPRI
Kamal	Garg	SEL
Chip	Christmann	Basler
Mathew	King	HDR
Steve	Piece	ECI
Gray	Hataway	Burns &Mc
Ted	Worren	Sothern Co
Don	Lukach	Ameren
Dinesh	Gurusinghe	RTDS
Sachintha	Kariyawasam	Power Engineers

Mike	Kockott	Hitachi Energy
Michael	Thompson	SEL Eng Services
Robert	James	PG&E
Sukumar	Brahma	Clemson University
Seth	Nelson	Basler

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 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

New Business

No planned new business

Sebastien Billaut motioned to submit Draft 3.1.2 of C37.114, IEEE Guide for Determining Fault Location on AC Transmission and Distribution Lines, to IEEE-SA for Sponsor ballot.

Second: Russ Patterson

The motion passed anonymously.

Russ Patterson made a motion to create Working Group D54 on Protection methods for non-effectively grounded distribution systems with an assignment to develop a report describing protection and fault location methods in use on un-grounded and compensated grounded distribution systems.
Second: Scott Hayes
The motion passed anonymously.

Alex Apostolov proposed to start a task force to write a report on IEC 61850 effect on transmission line protection. Ensuing discussion presented some disagreements about this topic, so it was tabled until the May meeting.

Adjournment

Karl Zimmerman motioned to adjourn the meeting. Second: Newan Perera.

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	Brian	Boysen	WEC Energy Group
Member	Stephen	Conrad	Public Service Co of NM - Retired
Member	Normann	Fischer	Schweitzer Engineering Laboratories
Member	Kamal	Garg	Schweitzer Engineering Laboratories, Inc.

Member	Scott	Hayes	PACIFIC GAS AND ELECTRIC
Member	Joshua	Hughes	Qualus Power Services
Member	Kevin	Jones	Xcel Energy
Member	Michael	Kockott	Hitachi Energy
Member	Joshua	Lamb	Ameren
Member	Raluca	Lascu	DTE
Member	Brandon	Lewey	Ameren
Member	Donald	Lukach	Ameren
Member	Bruce	Mackie	Northern Arizona University
Member	Pratap	Mysore	Pratap Consulting Services LLC
Member	James	O'Brien	Duke Energy
Member	Manish	Patel	Southern Company Services
Member	Russ	Patterson	Qualus Power Services
Member	Claire	Patti	Portland General Electric
Member	Nuwan	Perera	Power Engineers
Member	Gregory	Ryan	Ameren
Member	Charles	Sufana	Retired
Member	Jonathan	Sykes	Quanta Technology
Member	Looja	Tuladhar	Daymark Energy Advisors
Member	Eric	Udren	Quanta Technology, LLC
Member	Ilia	Voloh	General Electric
Member	Christopher	Walker	Mesa Associates, Inc
Member	Ted	Warren	Southern Company Services
Member	Karl	Zimmerman	Ameren
Member/Chair	Meyer	Kao	Qualus Power Services
Member/Vice-Chair	Alla	Deronja	ATC
Non-member	Amin	Banaie	EPRI
Non-member	Koustubh	Banerjee	Eversource Energy
Non-member	Seth	Barnes	TVA
Non-member	Matthew	Black	Sargent & Lundy
Non-member	Tim	Condra	TVA
Non-member	Milo	Daub	Mesa Associates, Inc
Non-member	Ethan	Grindle	ATC
Non-member	Muhammad	Hamid	Black & Veatch
Non-member	Gene	Henneberg	NV Energy
Non-member	Charles	Henville	Henville Consulting Inc.
Non-member	Daqing	Hou	Schweitzer Engineering Labs.
Non-member	Robert	James	Pacific Gas & Electric Co.
Non-member	Byungtae	Jang	
Non-member	Jack	Jester	Exelon Corporation
Non-member	Van	Le	WAPA

Non-member	Daniel	Lebeau	Hydro-Quebec
Non-member	Matthew	Leyba	GE
Non-member	Kevin	Malpede	ComEd
Non-member	Bernard	Matta	SEL
Non-member	Mark	Mcchesney	ONCOR
Non-member	Ryan	McDaniel	SEL
Non-member	Melvin	Moncey Joseph	Black & Veatch
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	Taylor	Raffield	Duke Energy
Non-member	Ian	Tualla	Duke Energy
Non-member	Quintin	Verzosa	Doble Engineering
Non-member	Jackie	Wilson	Ameren
Non-member	Abu	Zahid	Hydro One Network Inc.
Non-member	Alex	Apostolov	OMICRON
Non-member	Farnoosh	Rahmatian	NuGrid Power
Non-member	Tapan	Manna	Burns and McDonnell
Non-member	Raumdranauth	Ramlachan	GE
Non-member	Nicholas	Kraemer	NuGrid Power
Non-member	Garrett	Kirkpatrick	Burns and McDonell
Non-member	Sarhintha	Kanyawasam	?
Non-member	Aimal	Saeed	?
Non-member	Abdelhamid	Elarchi	Hydro Quebec
Non-member	Brittany	Wagner	?
Non-member	Mahtab	Vahabpour	PNM
Non-member	Xiangyu	Ding	S&C Electric

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

January 10, 2024

Chair: Hugo Monterrubio HugoM@ieee.org
Vice Chair: Mital Kanabar Mital.Kanabar@gmail.com

Relaying Communications and Control Scope

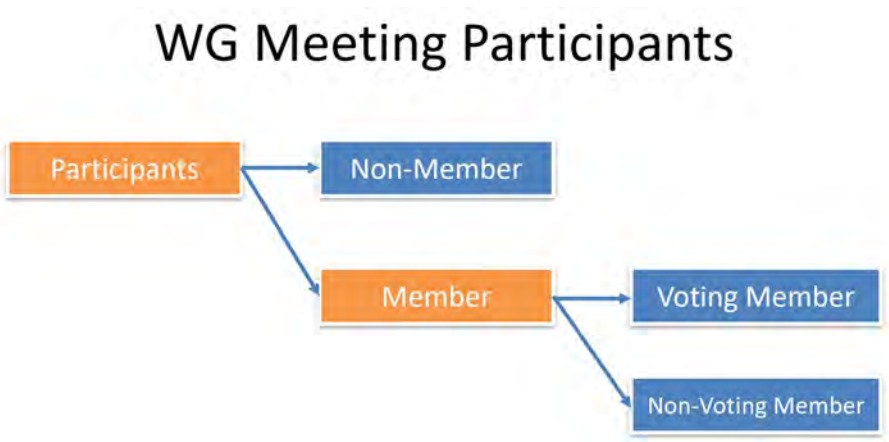
Evaluate and report on the characteristics and performance of protective relaying communications and control systems. Recommend communication requirements, operating and test procedures which assure reliable performance of the overall protection and control system. Report on new relaying equipment designs 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.

Meeting Minutes

- The H Subcommittee met in a hybrid format Wednesday January 10, 2024, at 1:10 PM CST with 25 members and 32 guests attending in person, 7 members and 17 guests attending remotely. Quorum was achieved with 32 out of 45 H SC members in attendance.
- The subcommittee was please to announce and introduce Craig Palmer as a new H SC member.
- A motion to approve the September 2023 H SC meeting minutes was made by Eric Udren and seconded by Eric Thibodeau. The minutes were approved unanimously.

Announcements

1. Announcements from AdCom
    a. New items from January 2024 AdCom Meeting
        i. Meeting Minutes – WG officers, to comply with our P&P procedure (6.4) please submit your WG meeting minutes within 15 days of your meeting. It must include a list of participants, their affiliation and their type of membership.



Please send your meeting minutes to the H SC Officers
- HugoM@ieee.org (H SC Chair)
- Mital.kanabar@gmail.com (H SC Vice Chair)

ii. 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)

iii. 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)

iv. Next PSRC meetings
- May 13-16, 2024 – Buffalo, NY (in-person)
- Sept 9-12, 2024 – Scottsdale, AZ (in-person)
- Jan 12-16, 2025 – Garden Grove, CA (hybrid)

b. New items from Awards and Recognition Meeting
   i. The next PSRC awards ceremony will take place Monday May 13 at 6:00pm in Buffalo, NY. 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

c. Reminders carried from prior meetings:
   i. SC Members are required to Vote on a variety of SC actions (P&P 7.1) to help approve motions, reports, surveys, etc.
      - HTF55 Vote was requested in October and to date we have not been able to capture the necessary 75% (3/4) of the SC member votes to approve.
      - Future electronic votes will contain the word "**ACTION REQUIRED-PSRC H-SC:"** in the subject. As an H SC member, we kindly ask that you please act when you receive these emails.

ii. 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.
iii. Upon work completion of your work, WG's are asked to please prepare a presentation to the MC.
    - Charlie Sufana to present H6 in next PSRC meeting

2. H SC Standards Nearing Expiration (12/31/2024 or earlier):

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 motion to the SC and a vote so this would have to happen in the September meeting so consider September as your deadline.

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.

No minutes available for this meeting

WG is working to address over 100 plus comments received from their voting round

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.

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.

H27 PC37.251, Standard for Common Protection and Control Settings or 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 2023
Status: Initial IEEE SA Ballot (Closed on June 20)

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

No minutes available for this meeting

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 14 attendees + 19 online attendees

The chair shared the H30 scope and this session agenda on
“User experience on **IEC 61850 Revenue Meters**”. The following users experience were shared:

- Craig Preuss shared the need and requirements about one of Black and Veatch's client wherein the client is unable to find a US standards compliant IEC 61850 Sample Value Revenue Meter. Criag also shared the IEC 61850 industry standardization and vPAC alliance.

Deepak discussed the IEC 61850 Sample Value application and the Revenue Meter interfaces. The following questions were raised to the group and discussed:

1) Does IEC 61850 9-2 meets the accuracy needs?
    a. with IEC 61869-9 metering profile?
    b. Edition-1 vs 9-2LE → Samples/cycle
    c. Edition-2 → Samples/second
2) Does the algorithm to calculate kWHr meet the accuracy needs?
3) Where does calibration to NIST verifiable accuracy come in the picture?
4) How to calibrate to NIST verifiable accuracy?
5) When multiple merging units are utilized, what impact will the GPS clock loss-of-synchronization or holdover have on the accuracy of revenue meters?
6) What architectures of merging units should be allowed/not allowed to ensure revenue meter accuracy?

The group discussion highlights are below:

- A Couple of relay manufacturers indicated that they can do IEC 61850 Sample Value revenue meters not with IEC 61869-9 sampling rates but at a much higher rate that suits their needs.
- IEC 61850 revenue meter involves additional challenges to lock & seal as with traditional meters. What and How do we lock & seal the meter? Does this involve Merging Units and communication? How do we handle the revenue meter algorithm and make it tamper-proof?
- A suggestion was made by NIST representatives to also include ANSI C12 working group as they are the lead in the US for revenue meters.
- Information was also shared on work-in-progress in IEC TC13 on project IEC TS 62053-25 “Electricity digital revenue metering”. Dustin mentioned that this IEC work is in the Committee Draft stage and is not addressing the experiences H30 is currently sharing.
- Alex Apostolov questions whether this topic should be considered in the H30 scope or even within the PSRC scope. The chair clarified that the topic is an overlap between substation P&C instrumentation and revenue meters, as IEC 61850 sample values and communications are in the scope of PSRC. It could be the case that the sample value stream could be feeding protection applications and revenue applications, as in the case of NCIT. Thus, the scope of H30 would be to share the experience and requirements on IEC 61850 revenue meters with other working groups/standard organizations to mature this technology further.

Another 1 or 2 meetings are expected to be held on this topic to share concrete conclusions on user requirements with the industry.

Attendees list:

Name	Affiliation
Deepak Maragal (Chair)	LND Technical Services
Dustin Tessier	Tesco Automation
Alex Apostolov	Omicron
Christoph Brunner	IT4Power Consulting
Shane Haveron	Ametek
Jay Anderson	SEL
Eric Thibodeau	Hydro-Quebec
Jim Campbell	Southern Company

Charles P	Power Industries
Hugo Monterrubio	Hubbell
Priyanka Nadkar	SEL
Andre Mellow	Schneider Electric
Greg Hataway	Burns & McDonnell
Criag Preuss	Black & Veatch
Muhammad Hamid	Black & Veatch
Darren De Ronde	Tesco Automation
David Tuckey	Schneider Electric
Dulce	Electro Industries
Greg Zweigle	SEL
Gustavo Brunello	GE
Hai	Electro Industries
Harsh Vardhan	GE
Herb Falk	OTB Consulting
Jose Ruiz	Doble Engineering
Jun Verzosa	Doble Engineering
Karen Wyszczelski	SEL
Marcos Velazquez	Doble Engineering
Piotr Przydatek	Schneider Electric
Tom Nelson	NIST
Xiangyu Ding	S&C Electric Company
Byungtae Jang	KEPCO, Korea

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 1 guests

The group discussed the following items:

- The need to directly map the TVTR / TCTR / MMXU / MSQI to ClcSrc was discussed as this is pertinent to how the calculations are done within Merging Units and what is transmitted. The current scheme does not allow the selection.
- Deepak discussed the need for InRef to be further split to represent separately the Binary/Analog quantities. Andre Melo mentioned a parallel work being done in WG10 in the related domain and suggested referring the work.
- The group also reviewed the PDIF functionality and identified that the alpha-plane characteristics from SEL are not well-represented.

S.No	Name	Affiliation	Membership
1.	Deepak Maragal	LND Technical Services	C
2.	Alex Apostolov	Omicron	VC
3.	Christoph Brunner	IT4 Power	M
4.	Mital Kanabar	GE	M
5.	Priyanka Nadkar	SEL	M
6.	Hugo Monterrubio	Hubbell	G
7.	Andre Melo	Schneider Electric	M
8.	Mohammad Zadeh	ETAP	M
9.	Scott Cooper	Omicron	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

The H40 Working Group met on Tuesday at 9:20 with 2 members and 4 guests. Quorum was not established. The ballot pool invitation was opened for PC37.1.2 in late December. The ballot pool will close on January 24th and we encourage folks to sign up. At the time of this report, there were approximately 31 Ballot Group members.

PC37.1.2 was also submitted to MEC for review. We anticipate resolving comments during the May meeting. The PAR expires in December of this year. We expect to be able to send to Revcom by October and therefore should not need an extension.

We plan to meet in May with the need for a room for 10 people with a projector.

Respectfully submitted,

-Theo

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

As chair, I hosted a local and online discussion.
The H41 WG met but did not have quorum, so an unofficial meeting was held.
The meeting included four virtual attendees, six local guests, and seven local members.

M/G	L/V	Name and affiliation
M	V	Karen Wyszczelski – SEL
G	V	Jose Ruiz - Doble Engineering
G	V	Marcos Velazquez – Doble Engineering
G	V	byungtae jang - KEPCO, KR
VM	L	Tom Dahlin – SEL
VM	L	Chris Huntley – SEL
VM	L	Craig Preuss – Black and Veatch
VM	L	Jay Anderson - SEL
VM	L	David Dolezilek – SEL
VM	L	Emmanuel Duvelson – Hubbel
VM	L	Mal Swanson
G	L	Ken Fodero
G	L	Adrian Zvarych – Qualus
G	L	Ken Martin – EPG
G	L	Eric Udren – Quanta Technology
G	L	Dalia Gonzales – IEEE SA Staff
G	L	Malia Zaman – IEEE SA Staff

Discussed Patent Slides, Copyright Slides, Participant Behavior slides

Discuss that PAR extension has been approved

Discussion of need to update the member list (as in agenda or list on imeet)

Discuss potential new members, Alexsander Rosa, Prasanth Gopalakrishnan

Discussion of confusion of 1646 labels for latencies and the labels in the historic IED illustration that had spurred prolonged discussion in the previous meeting. A proposal was heard to re-label the various sequential parts of the end-to-end latency model. A proposal was discussed, but not accepted, to re-label latencies to match the abbreviations “f” for function and “cp” for communications processing as they exist in the historical physical IED illustration and old version of the standard. This was considered ineffective because the “f” and “cp” in the sending and receiving IED are not symmetrical.

Dolezilek informally discussed collaboration with I4 and proposed that the WG consider referencing text and illustrations from several IEC documents

IEC 60834 for fundamental terms of protection and Teleprotection and typical operating times for protection using Teleprotection

and IEC 60255-1xx of internal IED data delivery latencies including repeatable test cases and perhaps example times

and IEC 60255-216 Test specification for protection data communication of Line Current Differential Protection as descriptions of internal IED interface latencies and potential data flow faults – presently aimed at 87 protection, specifically c37.94 and considering going beyond serial to include Ethernet.

and IEC 61850 90-1 Communication requirements for substation-to-substation communication
Guest Eric Udren discussed the 60255 series and an interest to collaborate with 1646 on this work

It was also discussed that this standard will be of interest to CPC and VPAC discussions.

adjourn

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: 5.0

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.

No minutes available for this meeting

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: 6.42

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

(Hybrid) Meeting # 50 (January 10, 2024) Minutes

The working group met on Jan 10, 2024 with 46 attendees – 16 voting members (out of 29) and 30 guests. The names and affiliations of attendees are enclosed in Annex I.

Chair presided over the meeting. Vice-Chair and 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 achieved. Proposed agenda as in Annex II was approved (Motion – Sakis, Second – Hugo, Dissent- None).

Chair informed that notes of the last WG (virtual) meeting (held on Dec 01, 2023) circulated via email dated Dec 05, 2023, were approved without any modifications. No further comments were received during this meeting.

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 over 1300 comments (1309 total) – 911 Editorial and 398 General/Technical Comments. A total of 799 comments out of 1309 comments were indicated as ‘must be satisfied’.

Chair also informed that WG has been meeting virtually since August 11, 2023 to discuss and dispose comments. WG voting members so far agreed on disposition of about 40% of General/Technical comments, 32% of editorial comments and a total of 30% of all comments. Two Drafts, 6.41 and 6.42, were released in 2024 incorporating the agreed comments dispositions. WG would take next few months to dispose all comments as per IEEE SA procedures and expected to issue the IEEE recirculation ballot 1 of the draft guide during the second quarter of 2024. Another IEEE recirculation ballot may be required based on the large number of comments. The issue of another short PAR extension, if required, would be discussed and addressed during the September 2024 meeting.

Discussion was then held on the following comment # disposition details on which some WG members suggested alternatives or have questions, although they were approved by majority of WG members:

Comment #: I-1134 (Commenter Craig who commented on the disposition details was not present): It was agreed to change the disposition Status to “Revised” with a Disposition Detail as:

"Replaced 'supported' with 'covered'.

I-424 (Commenter Craig who commented on the disposition details was not present):
It was agreed to add the comments from Craig to the disposition details.

Comment I-1134 and I-424 disposition status and detail were approved (Motion – Jack, Second – Arun/Hugo, Dissent- None).

Chair would follow-up with Craig for his agreement on these two comments dispositions.

Next WG meeting would be on Feb 2, 2024 at 10:00 AM ET.

Meeting was then adjourned (Motion: Mohammad, Second: Alex, Dissent: None).

Sincerely,

Ratan Das Paul Myrda Mital Kanabar

IEEE PSRC WG H45_Jan 10-2024_Meeting (#50) Attendees (Members) **Annex I**

#	Role	First Name	Last Name	Affiliation	Present
1	Chair	Ratan	Das	GE Gas Power, USA	Yes
2	Vice-Chair	Paul	Myrda	EPRI, USA	Yes
3	Secretary	Mital	Kanabar	GE Renewable Energy, Canada	Yes
5	Voting Member	Jay	Anderson	SEL, USA	Yes
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	Yes
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	Yes
14	Voting Member	Raluca	Lascu	DTE, USA	Yes
15	Voting Member	Yuan	Liao	U of Kentucky, USA	Yes
16	Voting Member	Vahid	Madani	GridTology, USA	Yes
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	Yes
27	Voting Member	Harsh	Vardhan	GE Renewable Energy, 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

In-Person only	8	
Virtual only	7	
Hybrid	1	
Total	16	

	IEEE PSRC WG H45_Jan 10-2024_Meeting (#50) Attendees (Guests)		
#	**First Name**	**Last Name**	**Affiliation**
1	Joel	Ankeny	Pacificorp
2	David	Busot	Tampa Electric
3	Fernando	Calero	SEL
4	Scott	Cooper	OMICRON
5	Catherine	Dalton	EPRI
6	Darren	DeRonde	TESCO
7	Kevin	Donahoe	GE Grid Solutions
8	Scott	Elling	Burns & McDonnell
9	Rafael	Garcia	ONCOR
10	Chris	Huntley	SEL
11	Byungtae	Jang	KEPCO
12	Matthew	Leyba	GE
13	Bernard	Matta	SEL
14	Andre	Melo	Schneider Electric
15	Mukesh	Nagpal	Burns & McDonnell
16	Nirmal	Nair	University of Auckland
17	SoonRyul	Nam	
18	Vicente	Navarro	
19	Gale	Nelms	SEL
20	Seth	Nelson	Basler Electric
21	Mahendra	Patel	EPRI
22	Ravindranauth	Ramlachan	GE Vernova
23	Charles	Sufana	Retired
24	Eric	Thibodeau	Hydro-Quebec
25	Justin	Turner	GE Grid Solutions
26	Marcos	Velazquez	Doble
27	Jun	Verzosa	Doble
28	Ilia	Voloh	GE Grid Solutions
29	Brittany	Wagner	Delaware Electric Coop
30	Malia	Zaman	IEEE - SA
	In-Person only	15	
	Virtual only	13	
	Total	28	
	Virtual -Partial (less than 50%)	2	

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 2024
Draft: v0.62

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

No minutes available for this meeting

H47: Impacts of IEC 61850 sampled values, GOOSE and PTP time synchronization on protection and control applications using process bus

Chair: Mital Kanabar
Vice Chair: Antonio Riccardo
Secretary: Dean Ouellette
Output: Report
Established Date: May 2019
Expected Completion Date: May 2024
Draft: 1.4b

Assignment: In a digital substation Protection and Control (P&C) devices rely on Sampled Values (SV), GOOSE and time synchronization (using Precision Time Protocol, PTP) together over process bus communications. This Working Group will 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.

No minutes available for this meeting

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.
Scope: Document fundamentals of packet-switched networks as they apply to protective relaying. Document teleprotection application requirements when using packet-switched networks; including latency, bandwidth, redundancy, switch-over, asymmetry, use of external

time synchronization for 87L with dependence on GPS. Considerations for leased networks (Service Level Agreement). Document any industry experiences. Outage processes and procedures.

The WG H49 met on January 9, 2023 at JTC in a Hybrid meeting led by Steve Klecker remotely. 35 attendees were present (6 members, 2 non-voting members and 27 guests). IEEE policy slides were presented. Quorum was achieved. Minutes of September 2022 and November 2022 Webex meetings were approved unanimously. Moved by Tom Dahlin, seconded by Ken Fodero.

A presentation on Use Case Template was given by Thomas Rudolph. The idea is to use a uniformed approach when describing utility use cases. Thomas explained methodology and a structure and provided examples. Work on such template for use by any organization is on-going in IEC, it is scheduled to complete in 2023.

A discussion on creating and using a template followed. No one posed any objections. It was expressed that using a unified approach would make material easier for the readers to absorb. Exact content of use case template should be discussed. Only a summary information can be covered, while a reference to conference papers providing more details can be included (two utility use cases already presented have conference papers published). It was suggested to start from use case structure presented by Thomas and modify it.

Discussion on report Outline followed. At November Webex meeting, Thomas suggested to include an in-depth discussion on lessons learned. This was added as a dedicated section in an updated Outline. Ken Fodero commented that this would be the key material of the report to share all the learnings, which was agreed. Ken also shared that the report should be written from protection perspective (many documents are written from IT/Com perspective). This was fully agreed on and captured in the updated Outline. It was also suggested to move network engineering and time sync topics into lessons learned section (as packet switched networks do require network engineering to achieve required performance) and move requirements discussion into introduction.

Lessons learned section will be written after material for use cases is added. Introduction could be worked on in parallel. It was suggested that introduction would be written by protection experts. Ken Fodero and WG Officers will look for volunteers.
The Chair suggested to have another meeting before next PSRC meeting, tentatively in March, and encouraged participants to join. He also solicited new WG members and asked for volunteers to present on utilities use cases. March meeting could be used to discuss template structure and content, and a utility presentation is planned for May meeting.

The meeting was adjourned on time. Ken Fodero moved, Hugo Monterrubio seconded.

For May 2023 meeting: a single session, a room for 30 people with a projector, a Hybrid meeting.

Meeting Room Requirements: Avoid A1, B2, P14 and H54. Current time slot Monday 1pm-2:10 pm local time works well. Attendee’s list is provided in a separate Excel file.

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.

Meeting January 9, 2024, 08:00 – 09:10 CST at the Sheraton New Orleans, Napolean B, called to order 08:05am. Chair Dean Ouellette presided; vice chair Anderson recorded minutes.

23 were in attendance including 7 voting members; quorum was achieved.

Patent, copyright, and IEEE participation slides were shown.

A motion was made by Jay Anderson and seconded by Jeff Dagle to approve the Minutes from the September 19, 2023 meeting. Minutes were approved.

Old Business

none

New Business

Review of draft 1.7.4: Rich Hunt compared the present H50 draft with IEEE 2030.101-2018, IEEE Guide for Designing a Time Synchronization System for Power Substations. Rich identified elements between the two documents that diverged or agreed, and where the H50 draft could be improved by additions or by providing references to 2030.101.

The results of the comparison, along with additional comments on the H50 draft by Rich, are available in the H50 iMeet folder under Draft Documents… Drafts in Progress… Review of 2032.101-2018.docx

PSRCC WG H50 Requirements for Time Sources in P & C Systems - Files & Discussions - iMeet Central

See the review document for details; first among them is that the H50 document should review the definition of a Clock. In 2030.101, “clocks” are generally referred to as “receivers”; it was the sense of the WG that “clock” may better describe the subject device functionality, which was noted often included a GNSS receiver (reference time source), an oscillator disciplined by the reference time source, and systems to output a time signal usable by other

devices, along with ancillary systems such as a management interface, condition alarm functions, etc.

The WG also noted that it may be advantageous to explore updating 2030.101-2018 due to advances in technology since that Guide was published.

A subgroup volunteered to begin to address and organize the results of the H50 – 2030.101 comparison. This may include a new Appendix to include recommendations for a future update to 2030.101. The new Appendix could include which elements should properly be in the body of the H50 report (clock requirements) and which should be included in 2030.101.

The volunteers for the subgroup were Jay Anderson, Rich Hunt, Chris Huntley, and Jeff Dagle. The subgroup was tasked with completing their work by mid-March. An interim Webex meeting to discuss the edits may be held in April prior to the May PSRC meeting.

The meeting was adjourned at the scheduled time on a motion by Chris Huntley, seconded by Rich Hunt..

Note: files for the H50 workgroup are stored in iMeet Central at:
https://ieee-sa.imeetcentral.com/psrcc-h50/folder/WzIwLDEyNTQ5NTk4XQ
For the next meeting, seating for 30 and a projector.

Avoid Conflicts: S15, C33, P20, P9 (if possible)

MEETING ATTENDEE LIST

Name	**Affiliation**	**Member Non-Voting Member Guest**
Dean Ouellette	Quanta Technology	M
Jay Anderson	SEL	M
Jeff Dagle	PNNL	M
Rich Hunt	Quanta Technology	M
Chris Huntley	SEL	M
Nicholas Kraemer	NuGrid Power	M
Aaron Martin	BPA	M
Mital Kanabar	GE	NVM
Deepak Maragal		NVM
Scott Mix	PNNL	NVM
Dustin Tessier	Tesco Automation	NVM
Ken Fodero	SEL	G
Ethan Grindle	ATC	G
Dinesh Gurusinghe	RTDS/AMETEK	G
Byungtae Jang	KEPCO	G
Hugo Monterrubio	Hubbell/Beckwith	G
Priyanka Nadkar	SEL	G
Gayle Nelms	SEL	G

Craig Preuss	Black & Veatch	G
Jose Ruiz	Doble Engineering	G
Arun Shrestha	SEL	G
April Underwood	Southern Company	G
Marcos Velazquez	Doble Engineering	G

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.

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 (in person).
b) Shane Haveron (Vice Chair) presiding (in person).
c) Call to order.
d) Intellectual Property slides.
e) Chair's remarks.
f) Results of call for quorum.
    a. 6 of 8 members present, Quorum established.
g) Approval of Agenda (motion and second).
    a. Hugo motion.
    b. Ethan second.
h) Approval of Minutes of previous meetings (motion and second).

a. September 2023.
    i. Shane motion.
    ii. Hugo second.
    iii. Motion passed unanimously.
b. May 2023.
    i. Ethan motion.
    ii. Shane second.
    iii. Motion passes unanimously.

i) Discussion.
a. Ellery & Nallan – Notes from COMTRADE discussion on Monday.
    i. Propose that ZIP archive specifications be in COMNAME (C37.232) rather than COMTRADE (C37.111).
    ii. COMTRADE Terminology document.
    iii. Rather than specifying a specific archiving technology / application, our informative annex should focus on how to define the directory structure and naming of the files within that folder structure. This strategy helps alleviate encumbrances with specific patented technologies.
    iv. Motion by Theo:
        1. Create a 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.
        2. Second Shane.
        3. Motion passes unanimously.
b. Ellery & Nallan & Ethan – Field type modification.
    i. Potentially informative annex describing what the “Type” field may be.
    ii. Potentially separate “Type” field into “Data Type” and “Trigger Type”. Create informative language.

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 (March - remote).
a. Specifically to discuss user fields.

Attendance

Members in attendance (6 of 8):
Amir Makki
Ellery Blood
Ethan Grindle
Hugo Monterrubio
Shane Haveron
Theo Laughter
Members absent:
Dan Sabin (conflict with C53)
Jun Verzoza

Guests (4):
Arun Shrestha
Byung Tae Jang
Hani Al-Yousef
Mital Kanabar

Discussion Points:

1. Potentially separate “Type” field into “Data Type” and “Trigger Type”. Create an informative language. Data Type includes strings such as “SER” for sequential events recorder data, “PMU” for Synchrophasor data, “RAW” for unfiltered point-on-wave data, “FIL” for filtered point-on-wave data, “MAG” [or “RMS”?] for root-mean-squared signal magnitude.
2. Geographic Position Coordinates (User Field) should not be defined in such a way as to include a comma (field delimiter). ISO 6709 includes delimiter-free location formats such as LAT/LONG specified as +DD.DDDD+DD.DDDD or +DDMM.MM+DDMM.MM or +DDMMSS.SS+DDMMSS.SS where “+” is a +/- sign character indicating East/West, DD is degrees, MM is minutes, and SS is seconds. For example, in +DD.DDDD+DD.DDDD, the Statue of Liberty is located at +40.6894-074.0447 .
3. Duration (User Field) should not be defined in such a way as to include a comma (field delimiter). ISO 8601 includes a duration format in the form of **P**[n]Y[n]M[n]**D**T[n]H[n]M[n]S. For example, "P3Y6M4DT12H30M5S" represents a duration of "three years, six months, four days, twelve hours, thirty minutes, and five seconds".

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. If schema exists, schema includes standard revision year?
4. Date field – support 2 and 4 year format?
5. Archive technology informative annex.

Resolved:

1. Delimiter – (Shall) First non-digit character (typically 7th or 9th) in file name. Fields may not contain the delimiter.
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. Schema Should/Shall be defined as …
4. Including fields in folder structure does not allow you to then omit that field from the contained file names.
5. Zip archives – should this standard specify file structure for zipped event record archives? - yes

   a. Create a 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.
6. Schema for file name – support flexible naming if schema provided? But still needs to contain all the required fields, just in order specified by schema.
7. Zip archives – should this standard cover naming of zipped event record archives? - yes

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

- Introductions were done and attendance was taken
  - 1 online, 7 in person
  - Quorum was not met
- Standard IEEE meeting slides were reviewed
  - No one mentioned any issues with patents
- Standard IEEE copyright slides were reviewed
- Updated the working group on the status of the guide
  - Technical edits have been completed
  - The working group is sending out the document for final editorial review by SWDG/PSRC/PSCC members in parallel

  Goal is to receive the first round of feedback by February 15th
  - Plan to have the document ready for the first round of ballet in April

Future Meetings:

Online meetings will not start again until comments are received.

Joint H53/P16 Meetings during PSRC/PSCCC Meetings to update progress.

Attendee List

Members	
NAME	**AFFILIATION**
Xiangyu Ding, H53 Chair	S&C Electric Company
Craig Preuss	Black & Veatch
Sal Martino	Duke Energy
James Bougie	Albireo Energy
Peiman Dadkhah	NuGrid Power Corp
Guests	

Dan Ransom	GE VERNOVA
Bernard Matta	SEL
Mark Adamiak	Consultant

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.

Call to Order: The fifth meeting of the H54 IEC/IEEE COMTRADE Revision Dual Logo Maintenance Team (DLMT) for COMTRADE Revision convened at 8:00 AM and was chaired by Mark Adamiak. Meeting minutes were recorded by Dan Sabin.
Quorum: A total of 35 people attended the meeting, including 17 of 33 working group members. This established quorum.
Required IEEE SA Slides: The slides for essential patents, copyright policy, and participant behavior were shown by Dan Sabin.
During the call for essential patents, a question was raised by Nicholas Kraemer 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 patents owned by PKWARE.
Action Item: The H54 DLMT leadership team will contact PKWARE and request that PKWARE submit a Letter of Assurance (LOA) to IEEE SA.
Review of Proposed XML/XSD for the XML Version of COMTRADE
Discussion of CamelCase vs camelCase: The working group discussed whether CamelCase (i.e., using phrases without spaces or punctuation and with capitalized words) should be used in the XML file. An example where CamelCase would be a problem would be “CCBM.”
Motion: Theo Laughner motioned that the naming convention for XML tags and attributes used in the COMTRADE revision should be a version of CamelCase in which the first letter is upper case. Zack Makki seconded the motion. The working group members approved the motion without objection or abstention.
There was a failed amendment to the motion that would have required the COMTRADE XML would be case insensitive.
There was discussion about specifying data compression using lossy and lossless compression algorithms and in possible changes in changing from row storage to column storage to optimize compression of channels that do not change in value (e.g., an rms value that changes only once per cycle, or a digital status value that does not change at all).
Container Format

Dan Sabin led the discussion on use of the Zip specification as a container format. He reported that he had completed a revision of the contribution that specified storage of more than one observation record in a single file.
There was discussion for methods for storing different sampling rates in one file versus storing different rates in different files. There was discussion on how porting COMTRADE 1991/1999/2013 files to the new COMTRADE would be easier if container files with multiple sampling rates were used.
There was discussion whether the container format could be specified in the COMNAME standard rather than in COMTRADE.
COMTRADE Record
Theo Laughner presented a report describing proposed COMTRADE Record terminology. There was discussion on whether some instances of the integer data type are required in cases where an unsigned integer would have been more appropriate.
Action Item: Working Group Leadership should review uses of integer data types.
XML File Discussion Subgroup
Zach Makki was asked to lead a subgroup to produce more examples of XML files
Next Meeting: The H54 DLMT will meet in person at the IEEE PES PSRC/PSCC Committee Meetings in Buffalo, New York on May 13, 2024.
Adjournment: The meeting adjourned at 10:30 AM.
Attendee List
The following 33 people attended the COMTRADE DLMT **meeting.**

First Name	Last Name	Company	Voting Member?
Mark	Adamiak	Adamiak Consulting	Yes
Hani	Al-Yousef	Eaton	Yes
Jay	Anderson	Schweitzer Engineering Laboratories	No
Galina	Antonova	Hitachi ABB Power Grids	No
Thierry	Bardou	Schneider Electric	Yes
Ellery	Blood	Schweitzer Engineering Laboratories	Yes
Laurel	Brandt	Tennessee Valley Authority	No
Christoph	Brunner	it4power	No
Xiangyu	Ding	S&C Electric Company	Yes
Robert	Fowler	ENTRUST Solutions Group	No
Jalal	Gohari	WSP	No
Dalisa	González	IEEE Standards Association	No
Dinesh	Gurusinghe	RTDS Technologies	Yes
Paul	Harris	PacifiCorp	No
Shane	Haveron	AMETEK Power Instruments	Yes
Yi	Hu	Quanta Technology	Yes
Byung-Tae	Jang	Korea Electric Power Company	No
Nicholas	Kraemer	NuGrid Power	Yes
Theo	Laughner	Lifescale Analytics	Yes
Zack	Makki	Softstuf	Yes
Deepak	Maragal	Eureka Power Solutions	Yes

Priyanka	Nadkar	Schweitzer Engineering Laboratories	No
SoonRyul	Nam	Myongji University	No
Christopher	Ness	Megger	No
Dhruv	Patel	Hubble	No
Shashidhar	Reddy	Schweitzer Engineering Laboratories	Yes
Daniel	Sabin	Schneider Electric	Yes
Arun	Shrestha	Schweitzer Engineering Laboratories	Yes
Eric	Thibodeau	Hydro-Québec	Yes
Justin	Turner	GE Grid Solutions	No
Benton	Vandiver	Hitachi Energy	Yes
Marcos	Velazquez	Doble Engineering	Yes
Ilia	Voloh	General Electric	Yes
Jeff	Wischkaemper	Texas A&M University	No
Malia	Zaman	IEEE Standards Association	No

The following voting working group members were not in attendance:

Jörg Blumschein
Jason Byerly
Mario Capuozzo
Ritchie Carroll
Jean-Sebastien Gagnon
Gopal Gajjar
Abel González
Joshua Hughes
Bogdan Kasztenny
Amir Makki
André Melo
Bruce Muschlitz
Gonzalo Vara
Murty Yalla

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.

Jeff Pack, Chair, presided and took the minutes
Meeting participants

Name	Affiliation	Attendance Type (W – Web, P – Phone, L – Local)	Member - Guest
Jeff Pack (Chair)	POWER Engineers	L	M
Craig Rieger (Vice Chair)	Idaho National Laboratory	W	M
Brian Johnson	University of Idaho	W	M
Van Le	Western Area Power Authority	W	G
Steven Kunsman	Hitachi Energy	L	G
Milo Daub	Mesa Associates	L	G
Rafael Garcia	Oncor	L	G

Quorum was achieved.
The agenda was reviewed with no recommended changes.
This is the fifth meeting of the Task Force.
Assignment Discussion:

- We discussed methods to gather information on potential collaborators and current work in the area.

Survey Status

- Survey was submitted to H subcommittee for approval after the May 2023 meeting. As of this meeting, we require 10 additional “yes” votes to move forward.
- During the H subcommittee meeting on January 10, a vote was called for and was also short the number of votes required.
- After the H subcommittee meeting, the H chair reached out to the remaining members that were not present in the meeting and determined that the H subcommittee has now approved the survey. The message from the chair is included below:

> After doing a complete rescan of the multiple email responses we received to Aaron's request for votes from last summer/fall and adding the in-person votes that we got today, I am happy to report that we got the 76% approval required to move forward. The results are as follows:
>
> H SC Members - 45
> Yes votes - 34 (76%)
> No Votes - 1

Abstains - 3
No vote/response – 7
You can continue to move forward with the survey.
Thank you,
Hugo Monterrubio

The next step for the survey is to obtain the approval of the PSRC Officers.
The chair displayed the current process for developing and distributing a survey under the PSRC Organization and Procedure Manual.
The meeting was adjourned at 2:03 P.M.
The Task Force will review the survey results and develop a draft report. If needed, the next in-person meeting will be in Buffalo, NY in May 2024.

----end of working group reports----

New Business

New H SC WG Ideation Session Taskforce – With a large number of H WG's in their last year of work, we need to start looking for future activity related to the SC scope. For this reason starting May 2024 a new task force will be formed to brainstorm about ideas and possible topics to create future new H SC task forces or working groups. The H SC Vice Chair will chair this TF. Visionary keynote speakers will be invited to share industry trends and thoughts to trigger these brainstorming sessions. Everyone is invited to these sessions and encouraged to suggest possible topics in advance. Please send emails to the H SC Chair and Vice Chair.

Adjournment

A motion to adjourn was made by Christopher Brunner and seconded by Scott Mix. The meeting was adjourned at 2:35 PM EST.

IEEE PES PSRC – I Subcommittee – Protection and Control Practices Meeting Minutes

HYBRID MEETING – New Orleans, LA and IEEE Webex
Wednesday January 10, 2024, 2:45 PM to 4:10 PM Central 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 provide 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. Milton Quinteros
   b. Travis Mooney
5. Determine a Quorum (**39 members** total in I-SC)
   a. Attendance: _29 (min 20 for quorum; YES X or NO __)
6. Approval of current meeting agenda
   a. Motion entered by: Michael Higginson
   b. Motion seconded by: Hugo Monterrubio
7. Approval of Minutes of the September 20, 2023, meeting
   a. Motion entered by: Michael Dood
   b. Motion seconded by: Kevin Donahoe
8. Coordination & Advisory Committee Meetings Items of Interest
   a. Subcommittee Members' status and incoming Officers for January 2023
   b. Attendee information (approximate): 256 PSRC attendees: 183 in-person, 72 online
   c. *Future Meetings – See "Future Meetings" page on PSRC website:*
      - *May 2024 – Buffalo, NY*
      - *September 2024 – Scottsdale, AZ*
      - *January 2025 (JTCM) – Garden Grove, CA*
      - *May 2025 – Portland, OR (tentative)*
      - *September 2025 – Cleveland, OH (tentative)*
   d. Looking for someone to help our webmaster with the PSRC website
   e. 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!**

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- Three officers: Chair, Vice-Chair, and Secretary
- All WG Officers must be members of IEEE SA

f. *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. This allows you to be on the relevant mailing lists. This system will also be used for registration for future meetings.

g. 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.

h. 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.

i. **Looking for presentations for future Main Committee meetings** – please contact Ritwik Chowdhury or Jim Niemira.

j. The PSRC Committee is international and open to anyone who cares to attend.

k. 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) 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

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- 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
- 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

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 or Vice-Chair of WG or 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 website which is open to all and/or published on the PES Resource page.

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.

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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.

- 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
- 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

m. Email WG/TF Minutes to Angelo Tempone at: 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.

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n. Email any changes to the Meeting Room Request (MRR) form for the *September 2023* meeting to Ritwik Chowdhury at ritwchow@ieee.org, 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.**

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?

WG/TF #	Name	Officers
I2 (Ongoing)	Terminology Review	**Mal Swanson** Claire Patti
I4 (Ongoing)	International Standards Development	**Eric Udren** Normann Fischer
I31	P1613 – Standard for Environmental and Testing Requirements for Devices with Communications Functions used with Electric Power Apparatus – Revision of 1613-2009	**Brian Mugalian** Jerry Ramie Craig Preuss
I32	A Survey of Protective System Test Practices	**Andre Uribe** Will Knapek
I33	Review of Relay Testing Terms	**Scott Cooper** Hugo Monterrubio
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
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
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

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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**
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
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**
ITF51	Evaluate interest in developing a summary paper for IEEE Std C37.110 Guide for the Application of Current Transformers for Protective Relaying Purposes	**Michael Higginson**

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 10:43 am (CST) on January 10, 2024, with Claire Patti, Vice-Chair recording minutes with 8 members and 2 guests in attendance. Quorum was achieved.

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The minutes from the September 2023 meeting were reviewed with no corrections provided, Matt Black motioned for approval and was seconded by Roger Whittaker with unanimous approval. Kevin Donahoe motioned for approval of the agenda, seconded by Benton Vandiver with unanimous approval.

Updates were given on each of the assignments.

The working group reviewed definitions for source-to-line impedance ratio (SIR) and control timer.

We are still looking for volunteers to liaise with the following working groups:

- C37.1.2: IEEE Recommended Practice Guide for Databases Used in Utility Automation Systems
- C37.101: Guide for Generator Ground Protection
- 2004: Recommended Practice for Hardware-in-the-Loop (HIL) Simulation Based Testing of Electric Power Apparatus and Controls
    - Joint activity with PELS, IAS, and IES.
- C37.246:

Mal explained to the working group that the responsibilities of I2 will be expanding to support reports and papers.

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 http://ieeexplore.ieee.org/xpls/dictionary.jsp.

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 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 11:58 am (CST)

ATTENDANCE LIST

W.G. I-2: TERMINOLOGY USAGE

January 10, 2024

New Orleans, LA

IEEE PES PSRC – I Subcommittee – Protection and Control Practices Meeting Minutes

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NAME	Member	Guest	
Mal J. Swanson, Chairman	**X**		
Claire Patti, Vice Chairman **Secretary**	**X**		
Roger Whittaker	**X**		
Yuan Liao	**X**		
Fred Friend			
Matt Black	**X**		
~~**Addis Kifle**~~			
Manish Patel			
Alla Deronja	**X**		
Masihuddin Mohammed			
Colleen Konsavage			
Benton Vandiver	**X**		
Kevin Donahoe	**X**		
Ken Fodero		**X**	
Byungtae Jang		**X**	

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.

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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.
Attendees: 11 total, 8 in person; 6 members
Chair Eric Udren called the meeting to order at 8:00 am CST on January 9, 2024.
Dr. Murty Yalla will retire as Chair of TC 95 internationally at the end of February 2024. The new Chair is Andrea Bonetti of Sweden, a long-time WG and MT contributor.
Normann Fischer, deeply involved in TC 95 standards developments for many years, suggests a shift of direction for the long term. The USNC should solicit increased utility participation in IEC standardization, which would give TC 95 new leadership options and market perspective in future leadership choices.
The next TC 95 Plenary Meeting with maintenance team meetings will take place in Largo, Florida February 19-22. The Plenary is on Thursday February 22. The Chair had distributed the agenda and background information documents on TC administration. We expect 4 US delegates at this time who are TAG and WG members.
The Project Team 216-3 on *Digital Interface - Test specification for protection data communication of Line Current Differential Protection* will also meet, 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. Not at meeting – Plenary presentations are now available.
- **95/533/AC** - Launch of WG3 on *Functional requirements for the protection of direct current (DC) transmission and distribution networks* – USNC is to propose Brian Johnson from the University of Idaho as member. WG3 is to present a project plan at the February 2024 Plenary.
- **95/538/RQ** – In response to question to national committees about restoration of 60255-187-2 and 187-3 differential relay functional standard projects that were cancelled due to SMB policy for projects more than 5 years late – both projects are being restarted now. 187-2 on bus relays will not get attention until 187-3 on line differential protection is competed.
- **95/536/RVN - TS 60255-216-1** – *Guidelines for requirements and tests for protection functions with digital inputs and outputs* (e.g., using MU data) – project to convert existing TR to Technical Standard (TS) is approved and draft is due to be issued by end of May.
- **95/549/CD** - *60255-27 Ed 3 AMD1 - Safety requirements amendment* – **95/548/CC** is compilation of comments – US comment based on Bill Morse input accepted. 95/549/CD is the revised draft – comments from USNC are needed by TA (the I4 Chair) to submit by February 16.
- **95/546/CD** – 60255-167: *Functional requirements for directional overcurrent* – CD is circulated and comments are due by February 9 (now submitted). After meeting – the draft

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was found to be immature and we submitted 16 pages of comments. We will wait to see if we need a PSRC WG to provide input to IEC MT.

- **95/553/RR** - 60255-21-1,2,3 – *Mechanical tests – shake and bump, vibration, seismic* – MT3 has been approved to merge into one new standard, Part 21. First CD due in January.
- Part 216-3: *Digital Interface - Test specification for protection data communication of Line Current Differential Protection* – This is a critical adjunct to 60255-187-3 for line differential relays, aimed at digital teleprotection data interfaces beyond C37.94. F2F meeting planned February 20-21 during week of TC 95 Plenary in Florida. IEC 60834 has long-standing definitions (2011-14) for timing of events we discussed. Dave Dolezilek chairs IEEE 1646 WG H41 that would like to coordinate with tests and definitions.

Meeting Participants:

First Name	Last Name	Affiliation	Role*
Eric	Udren	Quanta Technology	C
Normann	Fischer	SEL	VC
Travis	Mooney	SEL	M
Bill	Morse	SEL	M
Chris	Huntley	SEL	M
Ilia	Voloh	GE	M
Ken	Fodero	SEL	G
Tom	Dahlin	SEL	G
Dave	Dolezilek	SEL	G
Juan	Piñeros	XM-Colombia	G
Adrian	Zavarich	Qualus	G

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

For the next meeting, we need a room for 15 persons with a projector.

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I31: IEEE 1613 Standard for Environmental and Testing Requirements for Devices with Communications Functions used with Electric Power Apparatus

Chair: Brian Mugalian
Vice Chair: Jerry Ramie
Secretary: Craig Preuss
Output: Standard
Established Date: 05-Feb-2016 (PAR approval date)
Meeting Date: January 9, 2024
Expected Completion Date: 31-Dec-2023
Draft: 3.2 submitted to RevCom
Assignment: Revise 1613

a) Officer presiding: Brian Mugalian
b) Officer recording minutes: Brian Mugalian
c) Call to order, approximately 10:40 AM Central time.
d) Chair's remarks, general welcome
e) Results of call for quorum: quorum not met; 5 of 14 members; needed 8
f) Approval of September minutes: to be done by email.
g) Patent slides were shown, no claims were made.
h) Copyright slides were shown.
i) Participant behavior slides were shown.
j) Chair presented update on status; RevCom approved Draft 3.2 on 21 September 2023.
k) Working with IEEE on bibliography numbering order, John Tengdin in memoriam text.
l) Expect 1613-2023 to be published in February/March 2024.
m) Working group decided to create a presentation for the September 2024 PSRC/PSCC meeting.
n) The officers will meet over the next 90 to 120 days to create the presentation.
o) Motion to Subcommittee to disband will occur at the September 2024 meeting.
p) Chair will plan to submit the on-line awards request summer 2024.
q) Recess and time of final adjournment, approximately 11:50 am Central time.
r) Next meeting date and location will be May 13 – 16 in Buffalo NY.

Meeting Participants:

Name	Affiliation	Voting Status (voting member, non-voting member, guest)
Brian Mugalian	S&C Electric Company	Chair
Gerald Ramie	ARC Technical Resources	Vice-Chair
Craig Preuss	Black and Veatch	Secretary
Claire Patti	PGE	Voting Member
Abdelhamid Elarchi	Hydro Quebec	Guest

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Name	Affiliation	Voting Status (voting member, non-voting member, guest)
Bill Morris	SEL	Guest
Travis Mooney	SEL	Guest
Jay Anderson	SEL	Voting Member
Roger Whitaker	Self	Guest

I32: A Survey of Protective System Test Practices
Chair: Andre Uribe
Vice Chair: Will Knapek
Output: Report
Established: 05/2015
Expected Completion Date: 01/2024
Draft: Ver 1.0
Assignment: To review report prepared by working group I11 in 2001 called "Survey of Relaying Test Practices" and update the survey accordingly to today's industry environment.

Meeting Minutes

Did not meet

I33: Review of Relay Testing Terms
Chair: Scott Cooper
Vice Chair: Hugo Monterrubio
Secretary: Scott Cooper
Output: Report
Established Date: 1/19
Expected Completion Date: 9/23
Draft: 2.0
Assignment: Review the various definitions of relay testing terms and develop a Report with formal definitions in order to help eliminate any confusion.

Did not meet

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
Chair: Chase Lockhart
Vice Chair: Mat Garver
Output: Standard

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Established Date: September 2017
Expected Completion Date: May 2023
Draft: 5.0
Assignment: 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

The Working Group (WG) did not meet this time because the work is wrapping up.

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:

Name	Affiliation	Voting Status
Bill Morse	SEL	Voting Member
Todd Martin	Basler Electric	Voting Member
Travis Mooney	SEL	Voting Member
Roger Whittaker	Self	Guest
April Underwood	SCS	Voting Member
Malia Zaman	IEEE SA	Guest
Dalisa Gonzalez	IEEE SA	Guest
Josue Sanchez	Quanta Tech	Guest
Oscar Bolado	Quanta Tech	Guest
Matthew Mulka	S&L	Guest
Matthew Leyba	G.E.	Guest
Abdelhamid Elorchi	Hydro Quebec	Guest

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Tony Bell	Ametek	Voting Member

- Officer presiding: Bill Morse
- Officer recording minutes: April Underwood
- Call to order, approximately 1:00 pm
- General welcome
- The meeting had 5 Voting members.
- Patent slides were shown, no claims were made. Copyright and Participant behavior slides were shown, no claims were made.
- Agenda, September 2023, and December 2023 meeting minutes were approved.
- Travis Mooney approved the agenda. Todd Martin 2nd.
- Todd Martin approved the September 2023 meeting minutes. Travis Mooney 2nd.
- Todd Martin approved the December 2023 meeting minutes. Travis Mooney 2nd.
- Discussions:
  - The group discussed the ballot process. 75% of voting members required to approve the submittal of **I-37: C37.90** draft to go to Ballot.
  - Definition section updated to include title to relay.
  - Change to draft was approved by Todd Martin. It was 2nd by Travis Mooney.
- Action Items:
  - Review active members.
  - Provide Member list to IEEE SA
  - Monthly meetings to keep the ballot process moving forward.
- Final adjournment, approximately 2:00 pm CT.

I40: Review of IEEE C37.90.1 – Standard for Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus

Chair: Roger Whittaker
Vice Chair: Todd Martin
Output: Review for revision IEEE C37.90.1
Established Date: September 2018
Expected Completion date: Dec 31, 2024
Meeting date: Jan 10, 2024
Draft: 8
Assignment: Revise IEEE C37.90.1 – Standard for Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus.

Task Force I40 met on Tuesday, January 10 in a single session beginning at 8:00am CST. This was an hybrid meeting. There were 14 people in attendance including 3 online. A quorum was achieved with 6 of 10 voting members in attendance. Attendees were.

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Name / Affiliation / Status
Adrian Zvarych / Power Grid Engineering / Non Member
Austin Penny / Entergy / Non Member
Chales Pestell / IEEE / Non-voting Member
Elarchi Abdelhamid / Hydro Quebec / Non voting Member
Gerald Ramie / ARC Technical Resources / Voting Member
Hani Al-Yousef / Eaton Corporation / Voting Member
Louis Garavaglia / G&W Electric Co. / Voting Member
Peiman Dadkhah / NuGrid Power / Non voting Member
Roger Whittaker / Self / Chair
Tapan Manna / Burns & McDonnell / Non voting Member
Todd Martin / Basler Electric / Vice Chair
Tony Bell / Ametek / Voting Member
Travis Mooney / SEL / Voting Member
William Morse / SEL / Voting Member

After introductions, the IEEE patent slides were reviewed. No patent concerns were identified. There were no copyright issues identified.

The agenda was reviewed. The motion was made Gerald Ramie to approve agenda. The motion was seconded by William Morse. Agenda was approved.

Minutes from the September 2023 meeting were reviewed. The motion was made Gerald Ramie to approve minutes. The motion was seconded by Travis Mooney. Meeting minutes were approved.
Ballot met the 75% participation requirement. It was approved with 94% approval and 188 comments. Most of these are editorial, but some are technical. A task force will meet between now and May to put together resolutions for the non editorial. The task force volunteers are

Gerald Ramie
Hani Al-Yousef
Louis Garavaglia
Peiman Dadkhah
Roger Whittaker
Todd Martin
William Morse

All resolutions will be posted to the Imeetcentral workspace for the workgroup to access. If any workgroup member does not approve of a resolution then they can contact the chair or vice chair for reconsideration of the resolution. The task force will meet at 4PM EST on Mondays. The dates are not yet determined, but first meeting is expected to be in February.

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The remaining time was used to get a jump start on comment resolution.

Comment 27

Revise: Travis Mooney will work one some suggested language to clause 4 to resolve this clause. This should also resolve multiple similar comments

William Morse will be loading a document to share some technical information he was discussing during this resolution conversation

Comment 15

Accept: We will update the standard in accordance with this comment. This will remove all mentions of DUT (Device Under Test) and replace with EUT (Equipment Under Test). This will align with other standards in the same series. This will resolve multiple other comments as well.

Comment 82

Reject: The word is defined in IEEE dictionary. The group felt no further definition is needed. There were other request for change to definitions. All definition match what is in IEEE dictionary. The group sees no reason to change the existing definition

Comments 48 and 49

Revise: We will replace “surge” with “disturbance” for better clarity.

Comment 70

Revise: Instead of adding figure, we will correct the drawing to handle both test rep rates.

Comment 68

Reject: The group felt the size of figure was fine as is.

This completed the meeting. William Morse made the motion to adjourn the meeting. Gerald Ramie seconded the motion. The meeting was adjourned.

Chair: Steve Turner
Vice Chair: Dan Ransom
Secretary: (open)
Output: Standard
Established Date: September 22, 2020
Expected Completion Date: July 2023
Draft: 1

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Assignment: Revise and update C37.90.3, IEEE Standard Electrostatic Discharge Tests for Protective Relays

1. Officer presiding

The presiding officer at this online meeting was Vice Chair Dan Ransom.

2. Officer recording minutes

Vice Chair Dan Ransom recorded the minutes in this document.

3. Call to order

Vice Chair Dan Ransom called the meeting to order at 9:20 a.m., Eastern Daylight Time, on September 19, 2023.

4. Chair's remarks

Vice Chair Ransom welcomed all to the in-person meeting.

5. Results of call for quorum

The quorum check established that a quorum was present.

6. Approval of Agenda (motion and second)

It was moved and seconded to approve the agenda. This motion passed on a voice vote.

7. Approval of Minutes of previous meetings (motion and second)

It was moved and seconded to approve the previous minutes. This motion passed on a voice vote.

8. Brief summary of discussions and conclusions, including any motions

Vice Chair Ransom stated that the standard is finished and published, with thanks to all the working-group members. See the recent email from Chair Steve Turner to download a copy of the standard.

9. Action items
10. Items reported out of executive session (if such sessions have occurred)

There was no executive session.

11. Recesses and time of final adjournment (if different from our published face-to-face meeting agenda)

Vice Chair Ransom adjourned the meeting at 9:50 a.m. Eastern Daylight Time.

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12. Next meeting date and location (if different from our published face-to-face meeting schedule)

There is no next meeting because the work is complete.

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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 CT on Monday January 8th, 2024 in a Hybrid format.

a) Introductions

b) The chair, vice-chair, and secretary introduced themselves. The meeting opened with 10 members and 11 in-person/virtual guests. (17 in person / 4 virtual)

c) Quorum verification: A quorum was not obtained at the meeting, since less than 11 members were present. The January, May, and September meeting minutes could not be approved without a quorum. However, we will try to approve them electronically later.

d) Several conversations took place about the following topics:

   a. Possibility of this report leading to a guide or standard. In other words, PAR related document.
   b. Verification of content in terms of additional information or topics to be added based on comparison with existing IEC standards.
   c. Re-scheduling bi-weekly calls to another day for reaching a wider audience and participation.

e) Mark Adamiak volunteered to develop section 5 with content related to mitigation strategies.

f) The leadership of the WG will continue hosting the bi-weekly calls for developing the document.

The meeting was adjourned at 18:05 CT.

Our next meeting will be in Buffalo, NY in May of 2024 (time TBD). A room for 20 people will be needed.

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First Name	Last Name	Company	Voting Status
Mark	Adamiak	Adamiak Consulting	VM
Sudarshan	Byreddy	Burns & McDonnell	G
Donald	Campbell	Southern Company Services	G
Ritwik	Chowdhury	SEL	VM
Ethan	Grindle	American Transmission Company	G
Paul	Harris	Pacificorp	G
Jack	Jester	Delmarva Power- Exelon	G
Nicholas	Kraemer	NuGrid Power	G
Mark	McChesney	Oncor	VM
Johnny	Moore	SEL	VM
Jose	Ruiz	Doble	G
Jackie	Wilson	Ameren	G
Hani	Al-Yousef	Eaton Corporation	VM
Michael	Basler	Basler Electric Company	VM
Tapan	Manna	Burns & McDonnell	VM
Travis	Mooney	SEL	VM
Bill	Morse	SEL	VM
Jim	Michaelis	CAI	G
Paul	Nichols	Agbara Eng	G
Christopher	Ness	Megger	G

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I44: Skills Required to Program, Commission, Test, and Maintain Ethernet Based PAC Systems
Chair: Andre Uribe
Vice Chair: William Knapek
Output: Report
Established: 01/2020
Expected Completion Date: 05/2023
Draft: Ver 6.0
Assignment: Create report on Skills Beneficial to Program, Commission, Test, and Maintain IEC-61850 and other Ethernet Based Protection, Automation, and Control (PAC) Systems.

Did not meet.

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

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.

Call to order at 1237 ET, Wednesday 31 January 2024 via Teams

a) Introductions

b) The meeting opened with 10 members and 1 guest

c) Quorum verification: Achieved with 10 Members present!

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d) Topics Discussed (**Action Items in this color**):

a. Review the Report with James M's comments starting at Page 20.
b. Completed comments & review through Section 4.5.1.2. Pickup at this point at our next meeting

Meeting adjournment at 1332 ET.

Next Meeting: Wednesday, 31 January 2024, 1230 ET via Teams

ATTENDANCE LIST

Members:

Jalal Gohari

Adrian Zvarych

Bill Morse

Don Ware

James Michaelis

Jim O'Brien

Joshua Warner

Steve Conrad

Robin Byun

Guests:

Mark McChesney

Brandon Gould

Baker Chance

Matew Mulka

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Paul Nichols

Domian Perrin

Kim Pate

Sean Black

Wayne Johnson

I46: Guide for Grounding of Instrument Transformer Secondary Circuits and Cases

Chair: Bruce Magruder (Chair)
Vice Chair: Sudarshan Byreddy
Virtual Meeting/Teams: 9 January 2024, 9:20 – 10:30 AM CST
Output: Revise IEEE C57.13.3-2014
Established Date: January 2024
Expected Completion Date: December 2026
Draft:

a) Call to order – Bruce, 9:20 AM CST
b) Chair's greeting & remarks, a total of 7 participants joined the hybrid (in-person/Webex).
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) Quorum was achieved and Brian Mugalian made a motion to approve the May and September meeting minutes and Sudarshan Byreddy seconded it.

IEEE C57.13.3 assignments that were received were reviewed and discussed.

Brian Mugalian will review Section 4 –Completed
Jim O'brien will review section 5.1 through 5.4 – Completed
Bruce Magruder will review section 5.5 & 5.6 – Completed
Sudarshan Byreddy & Bruce will review section 5.7 - Completed
Shivam Prabhakar will review section 6 – Pending
Jim Niemira will review section 7 - Completed
Sudarshan Byreddy will write a new section 5.7.3.5 - Pending
Jim Niemira will review Annex A - Completed
Brian Mugalian will review Annex B - Completed
Bruce Magruder will review Annex C- Completed

Check the I-45 report and add a summary of it in section 4 and add citation. Annex B needs to be reviewed and update the references in the guide.

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Name	Affiliation	Voting Status (voting members)
Bruce Magruder	ECI Consultants	Chair – Voting Member
Sudarshan	Burns & McDonnell	Vice Chair - Voting Member
Matthew Mulka		Guest
Jalal Gohari	WSP	Voting Member
Abdep Hamid El arachi	BC hydro	Guest
Brian Mugalian	S&C Electric	Voting Member
Matt Black	Sargent & Lundy	Voting Member/ Terminology Liaison

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 first meeting for joint WG I47/S18. The chair called the meeting to order. The meeting was presided over by Nicholas Kraemer and minutes were recorded by Charles Pestell. The attendees introduced themselves.

This was the first meeting since PAR approval. A show of hands was called for to request membership. 7 in room & 2 online attendees expressed interest in membership. Sign in sheet circulated to record details.

Patent claim, IEEE copyright guidance and participant behaviour slides were presented with no comments from the meeting.

The proposed agenda was presented, James Formea proposed approval of the agenda, it was approved by unanimous consent.

The updated PAR was presented. The reason behind removal of the “COMFIRM” branding was questioned, the Chair stated that no reason was given by NESCOM and suggested that it could be re-instated in a future PAR revision. It was commented that branding in this way would be preferable given similar branding for other documentation associated with IEDs etc. The chair agreed to support this when (if) a PAR revision is submitted.

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A question was asked whether the definition of "IED" is constrained to physical devices or will include virtual devices also. The Chair responded that this will be a matter for later discussion.

It was asked if the documentation for transmittal of the IED firmware / software changes will be in a machine or human readable format. The Chair responded that this will be a matter for later discussion.
A summary of the I47 presentation describing current work to I49 and the ensuing discussions was given. A question was raised regarding the inclusion of dependencies and requirements within the release information. After discussion, the meeting consensus was that they should be included and that this is within the scope of existing PAR and that hardware and software dependencies should be treated in the same manner. Co-Chair asked if the group should provide feedback to I49 group. The meeting consensus was that I49 should be informed that hard/soft/firmware dependencies will be included in release information.

A review of the scope was made. Following discussion, the meeting consensus was that virtual devices are within scope. It was suggested that firmware changes should be categorized to help the end user understand the likely impact. IEEE 14764 includes a framework for this.

Topics within the current standard requiring revision were presented. The Chair commented that the clause language of the prior standard will require revision (use of "shall" in place of "should" etc.) Following discussion, the meeting consensus was that classification of functional changes was required. It was commented that defining our own severity rating would be a negative step given the existence of CVE & CVSS rating scheme and calculators. It was suggested we use this in place of the present standards' vulnerability scoring mechanism. S18 would probably be open to guiding the group on questions related to cyber security issues.

Co-Chair commented that Hydro Quebec are looking for an alternative to CVSS for OT equipment. A participant recommended we use CVE as the schema. A participant shared that a software release document specification has been created and shared publicly by MIT, this was shared with the Chair.

The inclusion of issue containment steps within the release document was discussed. No consensus was reached.

Discussion regarding the inclusion of known issues in the release document took place, again with no consensus being reached.

The present standard's ToC was reviewed. The Chair stated that the intention is to use the present ToC with modification as an outline, then predominantly re-write the document as new. The meeting agreed, by consensus, to include the following in the revised Table of Contents:

- Verification of delivered firmware package.
- Dependencies for correct operation.

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Nathan Wallace proposed adjournment, Seconded by James Formea. Passed by unanimous consent. Meeting closed at approx. 1650 CST.

Next meeting will be on May 13 - 16, 2024 held at Hyatt Regency Buffalo Hotel and Conference Center, Buffalo, NY.

Meeting Participants:

First Name	Last Name	Affiliation	Role*
Hani	Al-Yousef	Eaton	M
Don	Burkart	Con Edison	NVM
Swagata	Das	SEL	M
Abdelhamid	Elarchi	Hydro Quebec	M
James	Formea	Eaton	M
Nicholas	Kraemer	NuGrid Power	VC
Amir	Makki	Softstuf	NVM
Ryan	McDaniel	SEL	M
Gayle	Nelms	SEL	M
Austin	Penny	Entergy	NVM
Charles	Pestell	Powell	S
Craig	Preuss	Black & Veatch	M
Milton	Quinteros	Entergy	C
Eric	Thibodeau	Hydro Quebec	C
Tuan Tran	Tran	TVA	M
Nathan	Wallace	Cybirical	M

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

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 a hybrid format on Jan 9th, 2024, at 1 PM CST with 2 attendees in person and three were present virtually. All the attendees are members. Mohit S was available through Webex, and he recorded the minutes. Quorum was not met so agenda and previous meeting minutes couldn't be approved.

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Patent and copyright policies were reviewed and there was no potential claim. Gary K provided all the Visio files for the images he had from the 2015 standard. Plan is to update them to provide more clarity. We then reviewed and addressed some comments from Zach Z on Section 8 and 9. Good discussions ensued on primary injection tests using secondary test equipment for bus protection. Swagata D submitted her review work on Section 14, but we couldn't bring that to the table for discussion because of limited time. We plan to organize at least one virtual meeting before the next PSRC meetup.

Action Items:

- Ryan M to review Annex A and check if something related to troubleshooting and commissioning tips can be added.
- 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.
- Mohit S to update verbiage to have "shall" for Obligations; "should" for Suggestions; "may" for Possibilities.
- **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

Attendance List:

Mohit Sharma - Chair, SEL, Voting Member
Gary Kobet – Vice Chair, TVA, Voting Member
Ryan McDaniel – Member, SEL, Voting Member
Joshua Hughes – Member, Qualus, Voting Member
Swagata Das – Member, SEL, Voting Member

Old Business: None

The meeting was adjourned at 1:15 PM CST.

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
Output: Report
Established Date: January 2023
Assignment: Roadmap for Developing New or Updating Existing IEEE Standards to Address Issues of Centralized Protection and Control (CPC) Systems

Working Group I49 is a joint sponsor of this report whereas Task Force P21 of the Power System Communications and Cybersecurity (PSCC) Committee is the lead.

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The latest meeting minutes are posted in the relevant subgroup section in the PSCC Committee website: https://site.ieee.org/pes-pscc/protocols-and-communication-architecture-subcommittee-p0/.

Draft minutes are included below.

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PSCCC P21 – PSRC I49 Joint Task Force Meeting Minutes

Designation:	Name:
P21	Roadmap for Developing New or Updating Existing IEEE Standards to Address Issues of Centralized Protection and Control (CPC) Systems

Meeting Location:	Meeting Time:	Meeting Date:	Minutes Revised:	Minutes Approved:
Teams	3:40 PM	2024/01/08		

Presiding Officer:	Recorded by:	Draft Number:
Craig Preuss, Brian Mugalian and Mike Dood, Co-	Melvin Moncey Joseph	0.7

Attendance:

Name	Affiliation	Attending via Phone (P) / Web	M/C M/G
Andre Melo	Schneider Electric	L	M
Arun Shrestha	SEL	L	G
Austin Wade	SEL	W	M
Bernard Matta	SEL	L	G
Brian Mugalian	S&C Electric Co	W	M
Brittany Wagner	Delaware Electric Coop	L	G
Bruce Mackie	Northern Arizona University	W	G
Byungtae Jang	KEPCO	W	G
Carolina Arbona	Burns & McDonnell	L	G
Charles Pestell	Powell Industries	L	M
Chikashi Komatsu	Hitachi,Ltd	W	G
Chris Huntley	SEL	L	G
Colin Gordon	SEL	W	G
Craig Preuss	Black & Veatch	L	M
Dale Finney	SEL	L	M
Daqing Hou	SEL	W	M
Darren Deronde	Tesco Automation	W	M
David Williams	FirstEnergy	W	G
Dean Ouellette	Quanta	W	G
Deepak Maragal	Eureka Power Solutions	L	M
Dhruv Patel	Beckwith Electric	W	G
Dinesh Gurusinghe	RTDS	L	G
Don Ware	Qualus Power Services	W	M
Dustin Tessier	Tesco Automation	L	M
Eric Thibodeau	Hydro Québec	L	M
Ethan Grindle	ATC	L	G
Gayle Nelms	SEL	W	M
Greg Zweigle	SEL	W	G
Hani Al-Yousef	Eaton Corporation	W	M
Herb Falk	OTB Consulting	W	M

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Ilia Voloh	GE	W	G
Jack Jester	Exelon Corporation	L	M
James Bougie	Alberio Energy	L	G
Jay Anderson	SEL	L	M
Jeff Pack	POWER Engineers	L	G
Jim Michaelis	Commonwealth Associates, Inc.	L	M
Joel Ankeny	Pacificorp	L	G
Jose Ruiz	Doble	W	G
Juan Pineros	XM S.A. Colombia Power System Operator	W	G
Justin Turner	GE Grid Solutions	L	G
Laurel Brandt	TVA	W	G
Lin Shi	GE Vernova	L	G
Marcos Velazquez Lechuga	Doble Engineering	W	M
Mark McChesney	Oncor Electric Delivery	L	M
Matt Mulka	S&C Electric Co	L	G
Melvin Moncey Joseph	Black & Veatch	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
Neil Saia	Entergy Services, LLC	W	M
Nicholas Kraemer	NuGrid Power	L	G
Paul Harris	PacifiCorp	L	M
Paul Nichols	Agbara Eng	L	G
Priya Raghuraman	Siemens Industry Inc	W	G
Priyanka Nadkar	SEL	L	G
Ravindra Singh	NRECA	L	G
Sachintha Kariyawasm	Power Engineers	L	G
Scott Lee	SCE	L	G
Scott Mix	Pacific Northwest National Laboratory	L	G
Taylor I. Raffield	Duke Energy	W	G
Todd Martin	Basler Electric	L	G
Xiangyu Ding	S&C Electric Co	W	G

M:Member

CM: Corresponding Member

G: Guest

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Item no.	Notes	Action by
CALL TO ORDER	The co-chairs brought the meeting to order at approximately 3:40 PM.	
INTRODUCTIONS AND QUORUM	Quorum was met.	
AGENDA APPROVAL	Jim Michaelis motioned to approve, and it was seconded by Eric Thibodeau. No objections or abstentions.	
APPROVAL OF PREVIOUS MINUTES	Meeting minutes from November 8th meeting were shown. Mark McChesney motioned to approve the minutes, and it was seconded by Jim Michaelis. No objections or abstentions.	
P21 / I49 ASSIGNMENT	Roadmap for developing new or updating existing IEEE standards to address issues of Centralized Protection and Control (CPC) Systems	
REVIEW OF COPYRIGHT SLIDES	The task force will follow IEEE-SA copyright policies as best practice since the task force is preparing a report.	
REVIEW OF PARTICIPANT BEHAVIOR SLIDES	The task force will follow IEEE-SA participant behavior as best practice since the task force is preparing a report.	
OLD BUSINESS	None.	
NEW BUSINESS		
	Future Meeting schedule. It was asked during the meeting by a member whether we could change the time/date of the virtual meeting due to conflicts with vPAC alliance meetings. It was determined that it is best to have it from the 24th of January biweekly. Eric Thibodeau motioned to approve the new meeting schedule which will be biweekly from the 24th of January till the May PSRC/PSCC meeting, and it was seconded by Charles Pestell. No objections or abstentions.	Secretary to send out new meeting invites till the next PSRC/PSCC meetings in May

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Item no.	Notes	Action by
	Report Draft and Assignments. There was a discussion on various standards that needed to be included in the report. Volunteers were called for presenting on topics which haven't been presented on before and to write sections of the report.	IEEE/IEC 61850-9-3 - Leadership to reach out to Benton Vandiver for a presentation IEEE P2808 - Leadership to reach out to Nathan Wallace for a presentation IEEE C37.2 - Mike Dood and Dale Finney volunteered to write the section IEEE 1646 - Leadership to talk to David Dolezilek to volunteer to write the section IEEE 1686 - Eric Thibodeau volunteered to write the section IEEE C37.118 and PDC - Mital Kanabar volunteered to present on it IEEE PC37.231 - Charles Pestell volunteered to write the section
ITEMS REPORTED OUT OF EXECUTIVE SESSION	There was no executive session.	

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Item no.	Notes	Action by
TIME OF FINAL ADJOURNMENT	Approximately 4:50 PM.	
NEXT FACE TO FACE MEETINGS	May 13- 16 2024 Buffalo, NY September 9 - 12 2024 Scottsdale, AZ	

I50: Develop a summary paper for IEEE Std C37.92 Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources

Chair: Eric Udren
Vice Chair: NA
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.

This was the first meeting for WG I50. The chair called the meeting to order. The meeting minutes were recorded by Ritwik Chowdhury. 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.

The chair presented on the standard. There was discussion on the following items:

- Use of LV and HV classes and possibly misinterpretation of those terms. The terms HA and LA for high-level analog and low-level analog can add clarification.
- Use of Rogowski coil in applications.
- LEA is also very beneficial because it can prevent the dangers associated with open CTs (adding safety benefits) in addition to the convenience.

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Chair will provide outline with bullet points for several sections. Chair will send outline to the members of WG I50 and the members of WG I38 that developed IEEE Std C37.92-2023 to consider providing contributions.

Peiman Dadkhah volunteered to be the vice chair.

Meeting Participants:

First Name	Last Name	Affiliation	Role*
Eric	Udren	Quanta Technology	C
Ritwik	Chowdhury	SEL	M
Peiman	Dadkhah	Nugrid Power	M
Abdelhamid	El archi	Hydro Quebec	M
Charles	Pestell	Powell	M
Paul	Harris	Pacificorp	NVM
Laurel	Brandt	TVA	M

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

ITF51: Evaluate interest in developing a summary paper for IEEE std. C37.110 Guide for Application of Current Transformers for Protective Relaying Purposes.

Chair: Michael Higginson
Vice Chair: NA
Output: Recommendation to Subcommittee
Established Date: January 2024
Expected Completion Date: January 2024
Draft: NA
Assignment: Evaluate interest in developing a summary paper for IEEE Std C37.110 Guide for the Application of Current Transformers for Protective Relaying Purposes

ITF51 held its first meeting on Wednesday, January 10th in a hybrid meeting in New Orleans + WebEx.
7 individuals attended and participated in this meeting.

Michael Higginson presented an overview of the changes to C37.110 in the 2023 revision.
The task force discussed whether it would be worthwhile to create a summary paper on these changes to the Guide.
Per IEEE Xplore, there have been 367 downloads in 2023 after the publication in May.
At least 5 task force attendees expressed interest in participating in a summary paper on the Guide revisions.
Juan Gers volunteered to lead the summary paper efforts as chair of a newly-established working group, should it be approved by I subcommittee.

Michael agreed to provide participant email addresses to Juan.

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Meeting Participants:

First Name	Last Name	Affiliation	Role*
Michael	Higginson	S&C Electric Company	C
Juan	Gers	Gers USA	M
Ethan	Grindle	ATC	M
Henry	Quin	Entergy	M
Milton	Quinteros	Entergy	M
Laurel	Brandt	TVA	M
Priya	Raghuraman	Siemens	M

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

11. Old Business

a. Johnny Moore is our liaison for the Power System Instrumentation and Measurements (PSIM) Committee, including the Sensors Subcommittee for at least one year (December 31, 2024).

b. P0079 proposed entity guide PAR has been approved by NesCom and is now: Entity IEEE Standard **P3416 Guide for Test Sets and Tools for Testing Protective Relays**. BOG/CAG is the sponsoring committee and PSRC I-SC is the joint sponsor. Angelo Tempone is monitoring the activities until we find a new liaison. If you are interested in being our liaison, please contact Angelo at angelo.tempone@duke-energy.com.

c. If you would like to be a liaison, please email Ritwik Chowdhury at ritwchow@ieee.org. Still looking for liaison for the following committees:
   i. Transformers Committee, including Instrument Transformer Subcommittee.

d. WG I33 “Review of Relay Testing Terms” I-SC Recirculation results (from November 9, 2023):
   i. 32 out of 39 I-SC members (82%) responded to the ballot.
   ii. 30 of those 32 were approvals—with the remaining two disapprovals from the previous recirculation with no new comments. Overall 77% approval rate.
   iii. Need at least 75% approval from the subcommittee, which is 30 I-SC members.

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WG I33 has since resolved all comments and the changes will be sent out for recirculation within a week following this meeting.

e. PSRC WG I26 published IEEE PES TR117 *Mathematical Models for Current, Voltage, and Capacitively Coupled Voltage Transformers* on November 13, 2023. This technical report is available on the PSRC Knowledge Base (https://pes-psrc.org/reports) and the PES Resource Center (https://resourcecenter.ieee-pes.org/publications/technical-reports/pes_tp_tr117_psrc_111323)

12. New Business

a. MOTION requesting presentation of IEEE PES TR117 Mathematical Models for Current, Voltage, and Capacitively Coupled Voltage Transformers at the Western Protective Relay Conference (WPRC) in October 2024.

Note—Working Group to check formatting requirements from WPRC before submitting abstract.

Motion by: Steve Turner Second by: Cathy Dalton

Motion carried unanimously.

b. MOTION requesting IEEE-SA Ballot initiation for Working Group I37 using PC37.90 Draft 6.

Motion by: Marilyn Ramirez Second by: Andre Uribe

Motion carried unanimously.

c. MOTION requesting formation of a working group that drafts a summary paper for presentation at industry conferences summarizing the changes to IEEE Std C37.110 in the 2023 revision.

Motion by: Michael Higginson Second by: Sudarshan Byreddy

Motion carried unanimously.

d. WG I44 reporting on the “Skills Required to Program, Commission, Test, and Maintain Ethernet Based PAC Systems” is ready to go to SC ballot. The SC balloting will be initiated within a week following this meeting.

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e. New Task Force ITF52 formed. This task force is assigned to evaluate the need for a corrigendum for IEEE Std C37.92-2023.

Note—Eric Udren to serve as the chair.

13. Liaison Reports

Power System Instrumentation and Measurements (PSIM) Committee, including the Sensors Subcommittee – Johnny Moore

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Task Force to Review Title, Scope, and Purpose for the Revision of IEEE Standard 4 *Contains standard methods and basic techniques for high-voltage testing applicable to all types of apparatus for alternating voltages, direct voltages, lightning impulse voltages, switching impulse voltages, and impulse currents*	• IEEE Standard 4 (High-Voltage Testing Techniques - Above 1000 V) passed its 10 year life and went inactive • Title, scope, and purpose was conditionally passed through subcommittee vote with minor changes for PAR application to renew standard (one vote short of quorum, so members not in attendance were going to be polled for official approval)
WG P1122: Standard for Digital Recorders for Measurements in High-Voltage and High-Current Impulse Tests *Contains the necessary performance characteristics for such digital recorders to ensure their compliance with the requirements for high-voltage and high-current impulse tests and describes the tests and procedures that are necessary to show that these performance characteristics are within the specified limits.*	• Last minute issues were raised during balloting • WG addressed changes and conditionally voted to recirculate the ballot (no quorum was reached, so members not in attendance were going to be polled for official approval) • Hopes for publication by the end of 2024
Sensors Subcommittee Task Force for Sensors Application Guide *Provides the relevant sensor system selection guidance based on the performance requirements of the application for medium voltage current, voltage, and combination sensors.*	• Charter meeting for the task force • Questionnaire is being sent to utilities to gather information on sensor application usage and expectations • The intended deliverable is a technical report that will describe best practices for developing and deploying sensor systems
WG P2681 - Guide for Testing Medium Voltage Smart Grid Sensors and Intelligent Electronic Device Systems *Defines the test methods and conditions for measurement of systems of integrated voltage and current sensors and intelligent electronic devices (IED). The guide will allow the industry to test a complete sensor system for medium voltage power distribution (1kV to 69kV).*	• The document is currently being reviewed by the WG
IEEE P2426 - Guide for Field Measurement of Fast-Front and Very Fast-Front Overvoltages in Electric Power System *The definition, formation, and characteristics of fast-front and very fast-front overvoltages*	• Has been submitted to final RevCom ballot • Should be voted on by the end of the month

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are introduced. The various measuring techniques, including technical details that may be adopted for field application, are also described. Field measurement results measured in this guide are included for reference.	

Entity IEEE Standard P3416 Guide for Test Sets and Tools for Testing Protective Relays – Angelo Tempone, summarized by Ritwik Chowdhury

P3416 WG has their kickoff meeting on December 19, 2023, 14:00 to 22:00 (Beijing Time) in Blue Horizon Hotel, Jinan, Shandong, China. The chair, Hong Wang, presided over the meeting. The secretary is Jinlei Xing. Meeting minutes were recorded Jinlei Xing and Binchao Zhao.

Program manager, Jiajia Liu introduced the IEEE Standard development procedure.

Working group members reviewed the PAR and discussed the framework:

i. 4.3 title is changed to characteristic of power system protection testing for relay test sets

ii. Simplify the 4.3 sections into: Climate requirement, Mechanical requirement, EMC requirement, Safety requirement , functional performance requirements (such as Analog generator /accuracy, power, range & accuracy, frequency & bandwidth, low power analog generator, Binary input, Binary output,… Human-machine interface… Synchronization).

iii. About automatic test procedure, it is necessary to summarize the common features based on the existing practices from several test set manufactures. Besides, the guide can provide some use cases about the Automatic test procedure. For the test set, the capability to do automatic test shall be mentioned.

iv. It decides to include the digital interface in the scope of this guide. And a separated chapter 5 for digital interface “Chapter 5 Characteristic of relay test sets with digital interface”.

v. Automatic test is not linked with the digital interface.

i. Chapter 5. [Andrea, Naibo, Lei Xu, Minrui XU], Andrea is the chapter leader

ii. Chapter 6. [Xicai, Xiaozhou, Jinlei, Naibo, Andrea], Xicai is the chapter leader

iii. Chapter 7. [Hong, Chen Luofei, Xiaopeng Li], Hong is the chapter leader

Chapters were assigned:

i. Chapter 5. [Andrea, Naibo, Lei Xu, Minrui XU], Andrea is the chapter leader

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ii. Chapter 6. [Xicai, Xiaozhou, Jinlei, Naibo, Andrea], Xicai is the chapter leader

iii. Chapter 7. [Hong, Chen Luofei, Xiaopeng Li], Hong is the chapter leader

Few motions were made during the meeting.

- Motion #1

Approve the agenda for [12, 19, 2023] meeting as presented in https://sagroups.ieee.org/3416/.

Moved: Xiaozhou Song, Beijing Sifang Automation Company Ltd

Seconded: Wu Xing, Nanjing SAC Power Grid Automation Company Ltd

Motion passed by voice vote without opposition.

- Motion#2

Approve P3416 WG P&P as presented in P3416 Policies and Procedures.

Moved: Xiaozhou Song, Beijing Sifang Automation Company Ltd

Seconded: Wu Xing, Nanjing SAC Power Grid Automation Company Ltd

Motion passed by voice vote without opposition.

- Motion #3

Approve Jinlei Xing, as WG Secretary.

Moved: Xiaozhou Song, Beijing Sifang Automation Company Ltd

Seconded: Wu Xing, Nanjing SAC Power Grid Automation Company Ltd

Motion passed by voice vote without opposition.

PSRC China Satellite I-SC Liaison, Shenxing Shi

Not present and has not been present at any meetings so far.

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14. Presentation
    a. PSRC WG I26 Report "Mathematical Models for Current, Voltage, and Capacitively Coupled Voltage Transformers" – Steve Turner

15. Other announcements?

    a. Discussion regarding new process for I2 took place where they will provide additional documentation to reduce confusion on wording for work completed for the SC.

16. Motion to Adjourn, by N/A, second by N/A
    Adjourn time: 4:11 pm CT

Next meeting is in-person only in Buffalo, NY, May 2024.

Stay well, and we look forward to seeing you again soon!

Attendance List for the I Subcommittee Meeting

First Name	Last Name	Company	Role
Ritwik	Chowdhury	SEL	Chair
Angelo	Tempone	Duke Energy	Vice-Chair
Hani	Al-Yousef	Eaton Corporation	Voting Member
John	Cooper	OMICRON	Voting Member
Catherine	Dalton	EPRI	Voting Member
Kevin	Donahoe	GE VERNOVA	Voting Member
Michael	Dood	Schweitzer Engineering Labs	Voting Member
Normann	Fischer	Schweitzer Engineering Laboratories	Voting Member
Louis	Garavaglia	G&W Electric Co.	Voting Member
Rafael	Garcia	Oncor Electric Delivery	Voting Member
Michael	Higginson	S&C Electric Company	Voting Member
Chase	Lockhart	Burns & McDonnell	Voting Member
Bruce	Mackie	Nashville Electric Service	Voting Member
Amir	Makki	Softstuf Philadelphia	Voting Member
Todd	Martin	Basler Electric	Voting Member
Michael	Meisinger	S&C Electric	Voting Member
Hugo	Monterrubio	Beckwith Electric	Voting Member
Brian	Mugalian	S&C Electric Company	Voting Member

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James	Niemira	S&C Electric Company	Voting Member
Daniel	Ransom	GE Renewable Energy	Voting Member
Mohit	Sharma	SEL	Voting Member
Malcolm	Swanson	M J Swanson Associates	Voting Member
Steven	Turner	Arizona Public Service	Voting Member
Eric	Udren	Quanta Technology, LLC	Voting Member
Andre	Uribe	Qualus Power Services	Voting Member
Donald	Ware	Qualus	Voting Member
Roger	Whittaker	none	Voting Member
Adrian	Zvarych	Qualus	Voting Member
Sudarshan	Byreddy	Burns & McDonnell	Guest
Austin	Wade	SEL	Guest
Matthew	Black	Sargent & Lundy	Guest
Joerg	Blumschein	SIEMENS	Guest
Laurel	Brandt	TVA	Guest
Peiman	Dadkhah	NuGrid Power	Guest
Jeff	Dagle	Pacific Northwest National Laboratory	Guest
Manish	Das	GE	Guest
Juan	Gers	GERS USA	Guest
Van	Le	Western Area Power Administration	Guest
Ryan	McDaniel	SEL	Guest
Claire	Patti	Portland General Electric	Guest
Tuan	Tran	TVA	Guest
Jackie	Wilson	Ameren	Guest
Byungtae	Jang		Guest
Mark	Mcchesney	ONCOR	Guest
Charles	Pestell	Power Industries	Guest
April	Underwood	Southern Company	Guest
Juan	Flores	PSEG	Guest
Abdelhamid	Elarchi	Hydro-Quebec	Guest
Milo	Daub	Mesa Associates	Guest
Bernard	Matta	SEL	Guest
William	Thompson	Black & Veatch	Guest
Jada	Hawaz	SEL	Guest
Carolyn	Sun	Black & Veatch	Guest
Kevin	Malpede		Guest
Johnny	Moore	SEL	Guest

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IN-PERSON MEETING – New Orleans, LA
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Reference Material:

WG and TF Minute Format Template: **Please use the template to simplify compilation of the Minutes from all the groups! Refer to PSRC P&P for Working Groups, Subclause 6.4 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.

a) Officer presiding
b) Officer recording minutes
c) Call to order
d) Chair's remarks
e) Results of call for quorum
f) Approval of Agenda (motion and second)
g) Approval of Minutes of previous meetings (motion and second)
h) Brief summary of discussions and conclusions including any motions.
i) Action items
j) Items reported out of executive session (if such sessions have occurred)
k) Recesses and time of final adjournment (if different from our published face-to-face meeting agenda)
l) Next meeting date and location (if different from our published face-to-face meeting schedule)
m) Attendance list of participants: name, affiliation, and role (voting member, non-voting member, non-member, etc.)
n) 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.

If this is PAR related activity, include the SA document number in the Title of the Working Group.

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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, January, 2024, New Orleans, LA

J Subcommittee (SC) met Wednesday January 10, 2024 at 4:21 PM CST with 18 out of 31 members and 6 guests, reaching quorum. The Chair presided over the meeting. Meeting minutes were recorded by the Vice Chair.

A motion to approve the January 2024 J SC agenda was made by Ritwik Chowdhury and seconded by Steve Conrad. The agenda was approved unanimously.

A motion to approve the September 2024 J SC meeting minutes was made by Mike Thompson and seconded by Wayne Hartmann. 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 13B)
Status: 27th Meeting (1-09-24)

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 to Subcommittee with findings of the above

WG Report

1. The Working Group (WG) met on Jan. 9, 2024 in New Orleans, LA.
2. Attendance: 9 members and 8 guests; Quorum was met
3. Derrick Haas was Vice Chair for this Meeting (thank you Derrick)
4. The WG decided to shorten the Report's title to "Investigation of the Criteria for Motor Bus Transfer" from the longer "Investigation of the Criteria for the Transfer of Motor Buses." That change will be reflected in the next draft.
5. The WG reviewed comments/edits/corrections to the ballot where Tom Beckwith was a lead author or co-author. Tom commented directly on Draft 13 to create Draft 13B, which was used at the WG Meeting along with the comments on the Ballot spreadsheet.
6. The WG resolved all the General comments and started on Editorial comments. Changes were recorded in Draft 13B as well as the Ballot spreadsheet for work.

J Subcommittee Meeting Minutes, January, 2024, New Orleans, LA

7. The Chair will add a short paragraph in the Introduction section to advise readers that certain passages may be repeated in multiple sections as the Report development consisted of various groups/individuals conducting research then documenting and forming conclusions.
8. Chair will create new revisions of the Report and Ballot spreadsheet for continuance of the Ballot comment resolution.
9. Chair will hold inter-PSRC Meeting Virtual Meetings to continue the Ballot resolution work.
10. Comment Resolution Groups:
    a. The **editorial** group will consist of the following members: Wayne Hartmann, Doug Weisz, Tom Beckwith, JC Theron, and Bracy Nesbit.
    b. The **technical** group to resolve comments on "Modeling A" section will consist of the following members: Tom Beckwith, Wayne Hartmann, Doug Weisz, Dale Finney, Jason Eruneo, and Bracy Nesbit,
    c. The **technical** group to resolve comments on "Modeling B" section will consist of the following members: Dale Finney, Wayne Hartmann, Doug Weisz, Jason Eruneo, and JC Theron.
11. The meeting was adjourned (Bracey Nesbit motioned, JC Theron seconded

Next Meeting:
Double session, projector, room for 30 people for in-person meeting.
Note: Future J-15 Meetings will be In-Person only unless otherwise notified
The WG also requests no conflict with all J particularly J16 (C37.101), J17 (C37.102) and J20 (Sync)

J16: Revision of C37.101, Guide for Generator Ground Protection

Chair: Ryan Carlson
Vice Chair: Doug Weisz
Established: 2016
Output: Guide
Status: 19th Meeting (1-9-24)
PAR Expiration: Dec 2024

Assignment: Revise C37.101 Guide for Generator Ground Protection

WG Report

The WG met with 22 total participants of which 8 were guests and 14 were members.

Quorum was achieved. The Vegas, May 2023 and Myrtle Beach, September 2023 meeting minutes were approved.

Ryan reviewed the patent slides required for IEEE PAR WGs and he mentioned that the PAR ends 12-31-2024. This PAR which originated in 2017 has already been extended once. After discussion it was determined that further extension would not give the working group adequate time to finish the guide. We will be submitting a new PAR later this year for the continuation of this effort.

J Subcommittee Meeting Minutes, January, 2024, New Orleans, LA

Ryan mentioned he will post the latest working draft copy of C37.101 in the "Drafts in Progress" folder on imeetcentral this week. 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 was briefly reviewed again and the TOC of the latest draft for the guide was displayed. Ryan summarized the major organizational changes to the high impedance grounding section that will be taking place to align with the feedback received during the initial WG ballot.

The WG had a significant discussion related to a negative sequence voltage acceleration scheme that originated from the J12 working group. There was an element labeled 59G and 59GS which are shown connected at the same location on the relaying diagram. After discussion it was explained that the purpose of 59GS is to provide a higher pickup value to determine that the ground fault was not located on the secondary of the generator VTs. 59GS serves to enable the negative sequence voltage acceleration. The WG took an assignment to clarify this purpose in the guide.

The WG focused the majority session on reviewing and resolving comments in the high impedance section of the new guide.

The WG had a discussion on what to do with a writeup on resonant grounding that was included in the protection section. The WG decided to move it to the Grounding methods section even though it is more detailed than the descriptions of other grounding methods. Resonant grounding is encountered less frequently and the additional detail is needed as a result.

Bracy reviewed the existing high impedance grounding calculations Annex and noted that it will be an effort to align the references in the existing calculations to the new format of the guide. The WG will begin undertaking this effort after the reorganization of the high impedance section is completed.

In addition, Ryan will schedule a virtual meeting to continue to make progress on the WG ballot comment resolution. Of the 300 comments received approximately 180 have been addressed to date.

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 May 2024 meeting. Please schedule the session on Tuesday or Wednesday if possible to maximize attendance, but as we are requesting a double session if Monday is required then that is acceptable. The WG also requests to minimize conflicts with other J meetings.

J17: <u>Revision of C37.102 Guide for AC Generator Protection</u>
Chair: Manish Das
Vice Chair: Gary Kobet
Output: IEEE Guide
Draft: 7.8
Established: May 2017
Status: 24th meeting, Jan 8, 2024 (Hybrid JTCM, in New Orleans, LA)
Expected completion date: -
PAR Expiration: Dec 2024

J Subcommittee Meeting Minutes, January, 2024, New Orleans, LA

Assignment: Revise C37.102 Guide for AC Generator Protection

WG Report

WG met on Monday, Jan 8, 2024 in person and by Webex for a single session with attendance recorded from a total of 11 members and 25 guests. Quorum was not met. The Sep 2023 minutes will be approved via email.

Patent slides were presented, no claims were made. Copyright and Participant slides were also shared.

The Chair shared that Draft 7.8 was submitted to and approved by IEEE SA RevCom in December. The draft is now in the SA Editor's queue, and publication is tentatively scheduled for March 2024.

The Chair thanked all WG members for their substantial time and contributions over the last 6 years that has resulted in the successful revision of this guide.

The WG discussed whether there's value in writing a summary paper for this guide, with some comments as follows:

- Mike Thompson commented that a summary paper for C37.102 would be valuable as a timely advertisement to the industry of the availability of the revised guide. He also stated the decision on whether to write one is for the J subcommittee to make.

- It was also mentioned that a summary paper, if written, should be in a format that would be acceptable to all 3 conferences (GaTech, WPRC, Texas A&M) to avoid duplicate work. This may require some pre-planning.

- Normann Fischer questioned whether there was value in writing a summary paper. He thought a PPT presentation could be sufficient for the conferences. Others said that most conferences will not allocate a slot without submittal of an actual paper.

- Bracy Nesbit suggested that a streamlined process for writing any summary paper should be considered as volunteers are often challenged with time.

- Ritwik thought that the subcommittee should be selective and choose to only write summary papers that are the most impactful, and that this is an important guide that likely falls into that category.

- Hasnain Ashrafi commented that if a summary paper is written we should state in it that the material on Multifunction Generator Protection System, MGPS (from old 2006 revision) was integrated into other subclauses in the revised guide (so it is clear that the topic was not entirely removed in the new revision like the Introduction section may seem to be implying).

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In a show of hands in the meeting, roughly 10 attendees informally expressed interest in getting involved in writing the paper. J17 will convey this interest to the subcommittee, and the final decision on the next step (whether to form a new task force/WG, if at all) would come from the PSRC/J SC, via potential motions at the subcommittee meeting.

Meeting Participant List:

Name (Last, First)	Affiliation	Status
Ashrafi, Hasnain	Sargent & Lundy	Voting Member
Barnes, Seth	TVA	Guest
Brandt, Laurel	TVA	Guest
Carlson, Ryan	Burns & McDonnell	Voting Member
Chowdhury, Ritwik	SEL	Voting Member
Condra, Tim	TVA	Guest
Das, Manish	GE	Chair
Detrick, Michael	Westinghouse	Guest
English, Will	Consumers Energy	Voting Member
Eruneo, Jason	Duke Energy	Voting Member
Finney, Dale	SEL	Voting Member
Fischer, Normann	SEL	Voting Member
Gers, Juan	Gers USA	Voting Member
Gohari, Jalal	WSO	Guest
Gurusinghe, Dinesh	RTDS	Guest
Hannigan, Ashley	USBR	Guest
Hughes, Joshua	Qualus	Guest
James, Robert	PG&E	Guest
Jang, Byungtae	Naver	Guest
Kabra, Sunil	Westinghouse	Guest
Kanyawasam, Sachuree	POWER Engineers	Guest
Kwong, Vincent	LCRA	Guest
Lin, Ding	Manitoba Hydro	Guest
Mueller, Steven	Ameren	Guest
Nesbit, Bracy	LCRA	Voting Member
Ness, Christopher	Megger	Guest
Nichols, Paul	Agbara Eng	Guest
Odums, Brad	LCRA	Guest
Patel, Dhruv	Hubbell	Guest
Pineros, Juan	XM	Guest
Podany, Nick	USBR	Guest
Portise, Alex	Enercon	Guest
Reese, David	Burns & McDonnell	Guest
Sweet, Scott	Westinghouse	Guest
Thompson, Michael	SEL Eng Services	Voting Member
Zaman, Malia	IEEE SA	Guest

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Next Meeting:
For the May meeting, request a single session and space for 40 people and a computer projector, and no conflict with J16 (C37.101) if possible.

J20: Report on Practices for Generator Synchronizing Systems
CHAIR: Jason Eruneo
VICE-CHAIR: Ritwik Chowdhury
Output: Report (Draft 11.1)
Established: January 2019
Status: 14th WG Meeting, New Orleans, LA January 10, 2024

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 met with 9 in-person attendees and various remote attendees. Quorum was met. Will English moved motion to approve September 2023 meeting minutes and Bracy Nesbit seconded. The motion passed.

The technical comment resolution from recirculation ballots was shown.

- Almost all of the comments were editorial in nature
- The WG reviewed the one ballot comment that was more significant in nature. The WG agreed with the proposed resolution for the comment
- The WG was able to resolve all of the recirculation ballot comments

Ritwik Chowdhury moved a motion to submit the latest draft (with all recirculation comments resolved) to the PSRC Officers for approval. Bracy Nesbit seconded. The SC Chair noted that the 75 percent approval from subcommittee was achieved.

Ritwik moved a motion to adjourn the meeting. Wayne seconded. Meeting adjourned at 10:59 AM CST.

Meeting Participants:

First Name	Last Name	Affiliation	Role*
Jason	Eruneo	Duke Energy	C
Ritwik	Chowdhury	SEL	VC
Zeeky	Bukhalla	GE Vernova	NVM
Will	English	Consumer Energy	M
JC	Theron	GE	M
Derek	Haas	SEL	G
Bracy	Nesbit	LCRA	M

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Mike	Basler	Basler Electric	G
Mathew	King	HDR	G
Hasnain	Ashrafi	Sargent & Lundy	M
Laurel	Brandt	TVA	G
Manish	Das	GE Vernova	G
Nick	Podany	Bureau of Reclamation	G
Matchyaraju	Alla		M
Randy	Hamilton	Basler Electric	NVM
Ryan	Carlson	Burns & McDonald	M
Steven	Mueller	Ameren	M
Vincent	Kwong	LCRA	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 30 and a projector. Request no conflict with C45, I38, J17, J25, K31, and C50.

J21: Motor Protection Tutorial
CHAIR: Derrick Haas
VICE-CHAIR: JC Theron
Output: Tutorial
Established: September 2019
Status: WG (14th meeting January, 2024 New Orleans, LA)

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 5 members, 7 guests in person, and 4 guest, 1 member remotely and quorum was not met.

The chair called the meeting to order and asked for introductions.

September's meeting minutes will be approved via email.

No assignments (writing and PPT) were received and hence could none be reviewed.

Dale and JC close on Section 4 – Thermal Model.

Normann Fischer and Jason Buneo requested to be working members. Jason volunteered to help with locked rotor protection involving distance protection supervision.

Normann proposed removing synchronous machine example and having the tutorial focus on squirrel cage induction motors. The WG members present agreed with the proposal. Chair will follow up with rest of WG since there was no quorum.

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Chair to verify with Gary Kobet the type of synchronous motor in the examples (i.e. excitation type, etc).

If any assignments are turned in, Chair will look at scheduling a virtual meeting before the in-person May meeting in Buffalo, NY.

Latest outline was distributed, and now WG members can relate their assignments to the motor guide. Assignments below:

Outline Section	Title	Name(s)	Sections in C37.96
1	Equipment Description	Derrick Haas	4
2	Motor Protection Specifications	Derrick Haas	6.1, 6.2, 6.5
3	Pullout and Stall Protection	Bracy Nesbit, Dale Finney	5.1, 7.2.2, 7.2.5, 7.2.10
4	Thermal Model	JC Theron, Dale Finney	N/A
5a	Stator Winding Protection	JC Theron	5.2, 5.2.8, 7.2.2, 7.2.9, 7.2.10
5b	Stator Fault Protection	Will English	5.4, 5.4.6, 5.4.8, 7.2.10, 7.2.18
6	Rotor Protection	Derrick Haas	5.3, 7.2.3, 7.2.5, 7.2.9, 5.5, 7.2.5
7	Motor Bus Transfer	Tom Beckwith	6.4
8	Abnormal Supply Conditions	Shashidhan Sathu	5.7, 7.2.4, 7.2.6, 7.2.7, 7.2.8, 7.2.10, 7.2.15, 7.2.16
9	Fuses and overcurrent devices applied to motor protection	Bracy Nesbit	7.2.10
10	Additional Protection Considerations	Derrick Haas	5.6, 5.8, 5.9, 7.2.11
11	Adjustable Speed Motor Protection	Gary Stoedter	4.4, 6.3, 7.2.4, 7.2.6, 7.2.10, 7.2.18

Attendees:

First Name	Last Name	Company	Role

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Will	English	Consumers Energy	Member
Derrick	Haas	SEL	Chair
Bracy	Nesbit	LCRA	Guest
JC	Theron	GE Vernova	Vice Chair
Dale	Finney	SEL	Member
Brad	Odums	LCRA	Guest
Juan	Flores	PSEG	Guest
Mike	Basler	Basler Electic	Guest
Christopher	Ness	Megger	Guest
David	Reese	Burns & McDonnell	Guest
Zeeky	Bukhala	GE Vernova	Member
Jason	Buneo	GE Vernova	Guest
Normann	Fischer	SEL	Guest (Remote)
Ashley	Hannigan	USBR	Guest (Remote)
Hasnain	Ashrafi	Sargent & Lundy	Member (Remote)
Vincent	Kwong	LCRA	Guest (Remote)
Mohit	Sharma	SEL	Guest (Remote)

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: <u>Revision of C37.96, Guide for AC Motor Protection</u>
Chair: Zeeky Bukhala
Vice Chair: Jason Buneo
Secretary: --
Output: Guide
Draft: -
Established Date: May 2021
Status: WG Meeting 12
Expected Completion Date: December, 2025
PAR Expiration Date: December, 2025

Assignment: To revise and update C37.96, Guide for AC Motor Protection

WG Report

The Working Group held its twelfth meeting on Wednesday, January 10th, 2024, with 14 members (including two virtual) and 7 guests (including 5 virtual) in attendance.

I. Welcome/Introduction
   a. The Chair kicked off the first session at 8:05am CST and welcomed members and guests, this was followed by introductions.

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b. Chair reminded participants that PAR expires in December 2025, and that with that in mind, a different strategy of reviewing longer assignments was adapted at the November 2023 meeting. Assignments will be reviewed by small teams who will work with reviewer to resolve comments.

II. Quorum check

a. 14 of 29 members were in attendance. Quorum was not met.

b. Chair noted that quorum has not been met for the last 5 meetings and will review and update the membership roster using latest PSRC Policies & Procedures.

III. Approval of Meeting Minutes. Quorum not having been met, Chair will seek approval of January, May, September and November 2023 minutes by email.

IV. 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.

V. Assignments

a. 4.3.6.1 Brush-type (slip rings) – Bracy Nesbit.

i. Bracy reported that section did not require any editing but Figure 4—Typical brush-type synchronous motor control has an error. There is an arrow below the 56 relay that should be replaced by a diode symbol.

ii. Proposed replacing the existing figure with a more updated version showing modern controls that he shared. Working group recommended retaining the existing figure since these circuits are still in the field operating and that the new figure be added, and the text be modified accordingly. Bracy will draft and JC Theron will review.

b. Reviewed assignments from November 2023. Responses to Jason Eruneo comments:

i. 5.2 Stator Winding Protection – Andy Kunze

- Derrick Haas to look and see if the IEEE 242-2001 (Buff Book) has been reincorporated into different standards, namely the IEEE 3000 series. A cursory look seems like it is IEEE 3004 series that has components of the 242 standard. Derrick to verify.
- Chair to follow up on “horsepower” nomenclature. Different standards show it as “HP”, “Hp”, or “hp”.

ii. 5.4 Stator Fault Protection – Jason Buneo

- On the comment for why 3 phase faults are most likely to occur at the terminals, there was discussion as to why this is as claimed in the standard. One discussion is because the highest voltage has the highest stress for the insulation. Group decided to delete the sentence as it brings no additional value to the section.

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iii. Jason Eruneo will review responses to his comments provided by Andy Kunze (5.2 & 5.3), Jason Buneo (5.4), Will English & Bracy Nesbit (5.5). Comments are available in iMeetCentral.

VI. Next Steps.

a. Reviewed pending assignments.

i. Chair discussed current status of assignments and showed there was a backlog of assignments to be reviewed.

ii. Chair will seek volunteers to form small groups to review pending assignments.

iii. Yuan Liao was assigned to review 3 (Definitions).

iv. Chair to update assignment spreadsheet in iMeetCentral.

b. Chair reminded working group to complete assignments and upload output to iMeetCentral.

c. Next meetings.

i. February TBD, 2024, Virtual Meeting

ii. March TBD, 2024, Virtual Meeting

iii. April TBD, 2024, Virtual Meeting

iv. May 13th – 16th, 2024, Buffalo, NY

VII. Adjournment. Meeting Adjourned at 9:07am CST. (Jason Buneo motioned to adjourn and Bracy Nesbit seconded the motion).

Attendance:

Last Name	First name	Affiliation	Role
Bukhala	Zeeky	GE Vernova	Chair
Buneo	Jason	GE Vernova	V. Chair
English	William	Consumers Energy	M
Eruneo	Jason	Duke Energy	M
Finney	Dale	Schweitzer Engineering	M
Haas	Derrick	Schweitzer Engineering Laboratories, Inc.	M
Kabra	Sunil	Westinghouse Electric Company	M
Kumar	Prem	Bechtel	M
Kunze	Andrew	Enbridge	M
Nesbit	Bracy	Lower Colorado River Authority	M
Theron	Jacobus	GE Grid Automation	M
Farr	Tom	Eaton	M
Liao	Yuan		M
Brandt	Laurel		G
Das	Manish	GE Vernova	G
Hannigan	Ashely	USBR	G
Harmukh	Sajal		G
Odums	Brian	LCRA	G
Podany	Nick	USBR	G
Reese	David	Burns & McDonnell	G

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Next meeting:
Request a double session for May meeting for 30 with projector. Avoid conflicts with (ranked by criticality):

1. J15, J21, JTF28
2. J16, J17, J20, J22, J26, J27 & K31
3. J25

Schedule J22 to immediately precede J21.

J23: Report on Generator Condition Monitoring
Chair: Steve Turner
Vice Chair: Rob Messel
Secretary: Open
Output: Report
Established Date: May 2021
Status: (1-9-24)
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 the protection functions to monitor generators.
- Describe mechanisms of degradation and applicable monitoring devices.Work with other technical committees as necessary.

WG report
Here is a list of the writing assignments, some of which are still outstanding:

1. Use generator condition-based monitoring to detect potential problems before an actual fault develops and schedule maintenance.

   Bracy Nesbit – LCRA #submitted
   Dale Finney – Gave a detailed presentation

2. Describe and develop guidelines for online condition monitoring of large synchronous generators, including salient-pole rotors as well as cylindrical rotors.

   Bracey Nesbit – LCRA # submitted
   Rob Messel – Siemens Energy
   Have draft available for review at the next working group meeting.

3. Provide information on online condition monitoring techniques as well as recommending thresholds to trigger alarms and initiate remedial or compensating action.

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Abel Gonzales – Megger > Provide draft for review at next working group meeting

4. Demonstrate how to use specific the protection functions to monitor generators.

   Steve Turner & Doug Weisz > 64S commissioning and setting; outstanding
   Doug Weisz – Hubbell > Load Profiling/Commissioning/Injection; outstanding
   Laurel Brandt – TVA > 64F load profiling; this assignment has been completed
   Sungsoo Kim – TRC > Split Phase Differential; this assignment has been completed
   JC Theron – GE > **Outstanding**

5. Describe mechanisms of degradation and applicable monitoring devices.

   Ellery Blood – SEL, Inc. > Gave a detailed presentation

6. Pilot projects to explore this technology.

   Steve Turner and Dale Finney are working together on this project. Presently Stator thermal overload is under development.

7. Actual fault develops and schedule maintenance.

   Bracy Nesbit – LCRA & Dale Finney – SEL, Inc.
   Outstanding.

Steve Turner will start to develop the report using assignments that have been completed.

Next meeting:
Single session with accommodations for 20 people is requested. Request for a hybrid meeting

Meeting Participants:

First Name	Last Name	Affiliation	Role*
Steve	Turner	APS	C
Will	English	Consumer Energy	G
Dale	Finney	SEL	M
Laurel	Brandt	TVA	M
Mike	Basler	Basler	G
Don	Fente	SEL	G
Abel	Gonzalez	Megger	M
Bracy	Nesbit	LCRA	M
Jason	Eruneo	Duke Energy	G
Rob	Milner		M
Ellery	Blood	SEL	M

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J24: Report on Synchronous Generator Disturbance Recording
Chair: Shane Haveron
Vice Chair: JC Theron
Secretary: open
Output: Report
Established Date: September, 2021
Expected Completion Date: January, 2026
Draft: -

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 01/09/2024 at 9:20am CST with 4 people in attendance, 2 members and 2 guests. 2 out of 5 voting members present, quorum was not met. Mike Basler was welcomed and added as a voting member.

Proposed agenda and minutes from September meeting were reviewed and will be approved via email. Participant behavior, patent, copyright, and WG assignment were reviewed with no comments.

JC Theron's assignment "Generator Signals to be monitored during transient events" was reviewed again and the need to review requirements Ercot 255 and Nogrr 255 was highlighted.

Derrick Haas reported that J18 are no longer meeting due to the lack of IBR modeling information, but their work regarding effects of SSO due to IBR on rotating machinery protection and control could be of some relevance to the J24 report. The group feels that the monitoring required to detect SSO could be included in the report.

The chair presented a section on basics of fault and dynamic disturbance recording which covered input filtering, sampling and data acquisition, sample clock frequency tracking vs locked to a time source, FR/DDR/Trend data types, continuous and triggered recording modes, C37.118 and IEC 61850-4-30 standards, and data storage using COMTRADE and COMNAME, which are both under revision. More detail will be added to this section including figures to show the flow of data through the various data types and stored in simple fault record files.

This led to discussions on including synchrophasors, which is essentially DDR data, SCADA type data, oscillation detection and the implications of the presence of sidebands, and islanding events due to ROCOF. Derrick Hass volunteered to write a section on SSO detection, which will take some time. The chair asked for fault records which show synchronous generation related issues.

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The structure of the report will continue to be developed and when sections have been identified, volunteers will be invited to contribute. Will English's PRC-002 contribution will be included.

WG files and resources uploaded to ShareFile folder (https://psrc.sharefile.com/home/shared/fo6be30c-453a-4e15-a84c-500b1c1cf436).

Next meeting:
For the next meeting, a single session with accommodation for 10 people is requested. Please avoid conflicts with H46, H52, S15 and all of J, particularly J21.

Attendees:

Last Name	First Name	Company	Role
Basler	Michael	Basler Electric	Member
English	Will	Consumers Energy	Guest
Hass	Derrick	Schweitzer Engineering Labs	Member
Haveron	Shane	AMETEK Power Instruments	Chair

J25: Report on Synchronous Condenser Protection
Chair: Jason Eruneo
Vice Chair: Dale Finney
Secretary: open
Output: Report
Established Date: September 23, 2021
Status: 7th WG Meeting, New Orleans, LA January 9, 2024
Expected Completion Date: January, 2025
Draft: 3.2

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 11 in-person attendees and various virtual attendees. There was a check for quorum and a quorum was established.

September 2023 Meeting Minutes were approved by the WG

The WG discussed a presentation a member of the WG presented at a PES synchronous condenser study group meeting.

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- The PES group requested us to present to them our work on synchronous condenser pole slipping. They were concerned with our conclusion that a synchronous condenser could not slip a pole.
- The PES group presented a case where a synchronous condenser was connected to the collector bus of an IBR generating facility. When a three-phase fault was applied to the interconnecting line, the model showed the synchronous condenser slipping poles
- Dale Finney created a MATLAB model to try and recreate this case. The results of the MATLAB model showed that a synchronous condenser may slip a pole for a three-phase fault on the interconnecting line followed by the inverters (wind turbines) tripping. The model needs review to explain some questionable transient results within the analysis
- **Action Item: Dale & Normann** will create further modelling in RTDS in an attempt to verify the MATLAB results
- Gary K. created models for hydro and nuclear resources. The results of these models further validated Normann's previous model results that a synchronous condenser cannot slip a pole.
- Normann presented an analysis of a loss of field event for a synchronous condenser. The results showed that the impedance trajectory is very different than a synchronous generator. This may require new guidance for loss of field protection on a synchronous condenser.
    - **Action Item: Dale** will assist Normann in plotting the impedance loci for a synchronous condenser LOF relative to a traditional negative offset mho LOF scheme.

Action Item: Jason Eruneo will reach out to Kay Chen of the PES synchronous condenser study group to offer to collaborate on the WG report. We will offer for them to review our models. We will offer them an opportunity to provide a write-up for a section of the report.

Action Item: Normann will send Jason Eruneo the synchronous condenser data used in the RTDS model

Meeting Participants:

First Name	Last Name	Affiliation	Role*
Jason	Eruneo	Duke Energy	C
Dale	Finney	SEL	VC
Michael	Thompson	SEL Engineering Services	M
JC	Theron	GE	M
Ryan	Carlson	Burns & McDonald	M
Zeeky	Bukhala	GE Vernova	M
Ritwik	Chowdhury	SEL	M
Russ	Patterson	Qualus	M
Derek	Haas	SEL	G
David	Reese	Burns & McDonald	G
Greg	Hataway	Burns & McDonald	G
Alex	Portier	Enercon	G

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Ding	Lin		G
Gary	Kobet	TVA	M
Hasnain	Ashrafi	Sargent & Lundy	
Laurel	Brandt	TVA	M
Normann	Fischer	SEL	M
Raluca	Lascu		
Rob	Messel	Siemens	G
Sajal	Harmukh		G
Steven	Mueller	Ameren	G
Jalal	Gohari		G

*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 40 people and a projector

- Request to avoid conflicts with J17, J20, D29, and K31

J26: <u>Summary Paper - Modeling of Generator Controls for Coordinating Generator Relays</u>
Chair: Juan Gers
Vice Chair: Phil Tatro
Output: Summary Paper
Established Date: January 12, 2022
Status: 6th WG Meeting January 9, 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 9th, with 6 participants in person and two virtually, out of them, 5 members and 3 guests. A quorum was not achieved.

Juan Gers presented the latest version of the paper, in two-column format according to the IEEE template, which has 7 pages. Two minor editorial corrections were identified. Other than those corrections, the paper was regarded that fulfils the quality required and the goals established for the work of this group. Will English suggested to circulate the paper with the minor edits implemented to get the formal approval from Members prior to sending it to the J Subcommittee. The chairman will circulate the paper in the following days. It is expected a fast response from Members to complete the process soon.

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It was made clear that the paper is not appropriate for a transactions paper. However, it was agreed to open a discussion in the meeting of May to determine if a further work to go deeper in calculations and case analysis could be suggested to the J Subcommittee as part of a new group that could be approved, prior to disbanding the J 26 group.

Next meeting:
The requirements for the next meeting are a single session, a meeting room for 30 people, and a computer projector. Conflict with Group J17 should be avoided.

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: 5th Meeting January 9, 2024, 8:00am
Expected Completion Date:

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

a) Check for Quorum – 6/11 members present. Quorum met.
b) Approval of agenda: reviewed – no comments/changes.
c) IEEE SA Patent Policy was presented, and that the call for patents occurred and any responses to such Call. **Reviewed no comments**.
d) IEEE SA Copyright Policy presentation was presented or made available prior to the meeting. **Reviewed no comments**.
e) Approval of minutes of previous meeting: Not approved. Chair will send out for email approval.
f) Technical topics
1) The working group reviewed the submitted comments on Abstract.
2) The working group reviewed submitted comments. Action items were made to address comments. These included:
- Review of terminology and rewording narratives to improve clarity.
- Incorporating additional narratives on Guide changes into introduction.

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3) The WG reviewed the draft presentation of the summary paper. The main comments were on the slide format. Also, the WG discussed that the presentation should plan for 15 to 20 minutes.
4) The WG was concerned we could not meet the submittal times for the 2024 Texas A&M Conference; therefore, the plan is to postpone the paper completion to allow adequate review and WG consensus. The WG will focus in gathering comments and edits to the summary paper and presentation.

g) Action items

1) Steve Conrad – review terminology in the section V. Summary and recommend needed changes.
2) Sunil Kabra – Incorporate additional narratives on Guide changes into section I. Introduction.
3) Derrick Haas – Review and reword awkward narratives at the bottom of page 3 in "Other situational considerations: a).
4) Bracy – Assemble updates once Action Items 1), 2), &3) are completed and send to the WG members for review, comment, and/or approval. This may require a TEAMs meeting in March 2024 to get further input from the WG on updates.
5) Bracy – Send current form of Abstract with paper for WG Ballot.
6) Bracy – Update and send draft presentation to WG for comments.
7) WG - Paper and Presentation ready for presenting to committee for approval at future meeting.

h) Any items reported out of Executive Session – nothing to report.

i) Recesses and time of final adjournment: 9:20am

Derrick Haas – motion to adjourn and Steven Conrad second.

Next meeting:
Single session. With room for 15 and a projector. Please avoid conflicts with J16.

JTF28: Prepare J6, J14 Papers for Publication
Chair: Zeeky Bukhala
Vice Chair: Dale Finney
Established Date: May 11, 2022
Status: Task Force 4th Meeting January 9, 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.

TF Report

The Task Force held its fourth meeting on Tuesday, January 9th, 2024, with 4 members (including one virtual) and 1 guest in attendance.

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I. Welcome / Introductions. The Chair kicked off the meeting at 2:20pm CST and welcomed attendees to the task force's fourth meeting.
II. Approval of Meeting Minutes. Quorum was not met. Chair will circulate January, May and September 2023 minutes for approval by email.
III. J6 - Protection issues Related to Pumped Storage Hydro (PSH) Units – Update.
    a. Dale completed revision of the paper in December 2023 with all J subcommittee comments incorporated and sent to J subcommittee officers.
    b. Chair confirmed that negative ballot was resolved.
    c. Next step: Chair to send record of resolved comments to J subcommittee officers who will then submit to PSRC Officers for approval.
IV. J14 - Plant Protection Issues Associated with Black Starting of Generators
    a. Chair shared guidance that Tom Beckwith had received from IEEE in response to another IEEE working group facing similar challenges.
    b. Chair will take similar approach as used for J6 paper to ensure IEEE guidelines are followed, Revision will be editorial and will not have any technical updates.
    c. Chair asked for clarification on ballot process of this paper that had already been approved up to the PSCR officer level before being returned by IEEE. Chair intends to ask balloters to limit comments to editorial comments.
V. Adjourn. Meeting adjourned at 2:40pm CST.

Attendance:

First name	Last Name	Affiliation	Role
Zeeky	Bukhala	GE Power	Chair
William	English	Consumers Energy	G
Derrick	Haas	Schweitzer Engineering Labs	M
Gary	Kobet	TVA	M
JC	Theron	GE Grid Automation	M

Next meeting:
Single session. With room for 10 and a projector. Request no conflict with J15, J21, J22 and J25. Also request no conflict with J16, J17, J20, J26, J27, & K31 if possible.

Liaison Reports:

Electric Machinery Committee – M. Yalla, R. Messel – The major work that is going on in Electric Machinery Committee that is related to PSRC J subcommittee is in the Generator Subcommittee WG that is revising IEEE Std. C50.12 "Draft Standard for 50 Hz and 60 Hz Synchronous Generators and Generator/Motors Coupled to Hydraulic Turbines and Rated 5 MVA and Above". The WG is meeting around once a month, and the next meeting is on Jan 17,

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2024 (Virtual) and reviewing the comments on the following section of the Draft 1 of the standard:

a. **Section 5.5, P-Q capability diagram**
b. **Section 5.6, Variation from rated voltage and frequency**
c. **Section 6.7, Transient event and emergency duty requirements**
d. **Section 10.6, Commissioning Tests (Overspeed vs. Load Rejection)**

Industry Applications Society (IAS) / Industrial & Commercial Power Systems (I&CPS) – D. Haas – 34 Standards under PAR per IAS website (through all IAS sponsored groups, ICPS, PCIC, etc):

Noteworthy:

- P841 - Standard for Petroleum and Chemical Industry–Premium-Efficiency, Severe-Duty, Totally Enclosed Fan-Cooled (TEFC) Squirrel Cage Induction Motors–Up to and Including 370 kW (500 hp)
- P841.1 – Standard for Process Industry–IE3, Severe-Duty, IP 56 Squirrel Cage Induction Motors–Up to and Including 370 kW
- P1349 - Guide for Application of Electric Motors in Class I, Division 2 and Class I, Zone 2 Hazardous (Classified) Locations
- P1584 - Guide for Performing Arc-Flash Hazard Calculations
- P3002.3 - Recommended Practice for Conducting Short-Circuit Studies of Industrial and Commercial Power Systems
- P3002.7 - Recommended Practice for Conducting Motor-Starting Studies in Industrial and Commercial Power Systems

Important:

- P3004.8 - Recommended Practice for Motor Protection in Industrial and Commercial Power Systems, Chair: Lorraine Padden - were on track for WG ballot this year Q1, with Publication date just before PAR expires in 2026.
- **Action Item: Derrick** will try to get a summary of what is changing in 3004.8, as it may pertain to J21, and J22 and C37.96 work.

The IEEE color books are going away. They are being broken up into new standards (3000 series standards).

- **Action Item: Derek Haas** to find the schedule of the IAS work for creating the new standards

Nuclear 1E WG – P Kumar – The WG is in the process of revising IEEE 741

For the 741 revision, the WG is working on the new PAR. Two task forces to address each area of the proposed PAR have been established and are underway, they have the K11 from PSRC website:

J Subcommittee Meeting Minutes, January, 2024, New Orleans, LA

1. Add an Annex on “impacts of power quality on Class 1E systems”

    - From 19-01 Meeting Minutes: Coordinate with IAEA on utilizing their intellectual property within 741 (owner – Singh Matharu). Closed – Link Provided to obtain report and concurrence to utilize the standard.
    - From 20-02 Meeting Minutes: Coordinate with the PSRC (WG K11) for scope of Open- Phase paper and its relationship with WG 4.7 (owner – Joe Krvavac). Closed – The paper has been issued by the committee and can obtained from their site.

2. Address previous ballot comments

Old Business:

J20 SC Ballot Results – Second J subcommittee recirculation was performed on December 5, 2023 with the following motion made by Jason Eruneo and seconded by Ritwik Chowdhury **motion** “to approve draft 11.0 of the report Practices for Generator Synchronizing Systems”. The required 75% approval was achieved via email vote.

J SC Scope Discussion WTGs (type 3 & 4), PV, BESS Motion– The subcommittee had a significant discussion on whether to form a task force. Most of the discussion was about the validity of adding inverters to the J subcommittee scope. It was deemed that this discussion was more appropriate to be had within the task force.

Bracy made the following **motion**.
Create a task force having the Assignment: Investigate the need to modify the scope of the J subcommittee to include protection related to Inverter-Based Resources, Inverter-Based Resource Generation Facilities, and any additional generation resources. Provide a recommendation for any possible modifications to the J subcommittee scope. Notes: The output of this task force could be a recommendation to the J subcommittee, recommendations to the main subcommittee for another subcommittee to consider these resources within their scope, or provide a reference to a subcommittee within the IEEE PES that is better suited for the protection of these generation resources.

Steve Turner seconded the motion. 15 approval votes, 1 oppose vote, no abstention. The motion passed, JTF29 was formed.

New Business:

C37.102 Summary Paper Working Group Proposal – The subcommittee discussed the desire to write a summary paper for the C37.102 revision. The subcommittee discussed the value of creating a reduced version of C37.102 and taking up resources within the J subcommittee. It was expressed that it may be better to talk about how we got to where we are with the revision and the history of the revision within the summary paper. This approach was supported by members of the subcommittee.

Derek made the motion to create a working group to write a summary paper for the revision of C37.102. Jason Buneo seconded the motion. 15 approval votes, 0 oppose votes, 0 abstentions. The motion passed, J30 WG was formed. Steven Mueller will act as the chair for the J30 WG.

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IEEE Tutorial on the Protection of Synchronous Generators Revision Discussion – Mike T. expressed that the tutorial was very helpful for him when he began understanding generator protection. The tutorial has been revised in the past in line with previous guideline updates.

The WG discussed whether we have to wait until the summary paper is complete or can we work on the, in parallel. J Subcommittee is stretched thin with the existing open WGs, the preference would be to wait one or two WG meetings to allow more WGs to disband and then open this WG. WG agreed to postpone opening this assignment

Adjournment:

Motion to adjourn was made by Dale and seconded by Zeeky. The meeting was adjourned at 5:47 PM CST.

Meeting Participants:

First Name	Last Name	Affiliation	Role*
Will	English		C
Jason	Eruneo	Duke Energy	VC
Zeeky	Bukhala	GE Vernova	M
Jason	Buneo	GE Vernova	M
Ryan	Carlson	Burns & McDonald	M
Ritwik	Chowdhury	SEL	M
Stephen	Conrad	Public Service Co of NM - Retired	M
Dale	Finney	SEL	M
Juan	Gers	GERS USA	M
Derek	Haas	SEL	M
Wayne	Hartmann	GE Grid Automation	M
Hugo	Monterrubio	Hubbell	M
Bracy	Nesbit	Lower Colorado River Authority	M
Jacobus	Theron	GE Grid Solutions	M
Michael	Thompson	SEL Engineering Services	M
Steven	Turner	Arizona Public Service	M
Michael	Basler	Basler Electric Company	G
Todd	Martin	Basler Electric Company	G
Normann	Fischer	SEL	M
Laurel	Brandt	TVA	G
Hasnain	Ashrafi	Sargent & Lundy	M
Steven	Mueller	Ameren	G
Matchyaraju	Alla		G
Mukesh	Nagpal	Burns & McDonald	G

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

K Substation Protection Subcommittee Meeting Notes, January 10, 2023, 2:45 – 4:10 CST – New Orleans, LA

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**
- **16 members and 33 guests were in attendance (in person and virtually).**
- **Check for quorum (16 out of 29 members, need 15 for quorum), quorum was made**
- **Approval of agenda (Kamal Garg motioned, Paul Elkin seconded, approved unanimously)**
- **Approval of previous meeting minutes (Hillmon Ladner-Garcia motioned, Pratap Mysore seconded, approved unanimously)**
- **Advisory Committee items of interest**
    - 256 attendees indicating PSRC as primary area of interest, 183 were in person
    - Future meetings:
        - May 2024 – Buffalo, NY
        - Sep 2024 – Scottsdale, AZ
        - January 2025 – Garden Grove, CA
        - May 2025 – Portland, OR (Expected)
    - Prices at future meetings are likely to increase
    - 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.
    - New draft O&P is available on website, this draft is with PES for review/approval.
    - Please provide meeting minutes to Brandon by January 19th. 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:

The WG I9 and WG K12 jointly met (in person) on January 8, 2024, at 13:00–15:00 CST; 17 attendees attended the meeting. K12 had 1 member and 1 guest present. Quorum was not met.

- Introductions
- IEEE patent slides – (http://standards.ieee.org/about/sasb/patcom/materials.html)
- IEEE behavior slides – (https://standards.ieee.org/wp-content/uploads/import/documents/other/Participant-Behavior-Individual-Method.pdf)
- Working Group Profile – Update as needed
  - Reviewed myProject profile and updated the PAR title.
  - Officers to update the working group roster in myProject.
  - Officers to update the working group name in myProject, pending any issues with the PAR or balloting.
- Review and Approve Minutes/Notes from the Last Meeting https://ieee-sa.imeetcentral.com/p/aQAAAAAFCx_Z
  - Minutes approved unanimously, motion by David L., 2nd by Daniel H.
- Working Group Overview and Activities
- Review of updated and approved PAR
  - Updated PAR was presented with changes that NesCom approved in Nov 2023. Changes were mainly focused on replacing the Static Shunt Compensator with Dynamic Reactive Power Compensator.
- A short update on the Ballot process and the next step for the final document
  - Draft was submitted to MEC, and a ballot pool was initiated in parallel; comments from MEC are expected by January 21, 2024. The ballot invitation period also expires on January 21.
- A short update on “How to Join an IEEE SA Ballot”
  - The WG walked through the process for ballot sign-up during the meeting. Eight balloters were added to the pool during the meeting.
- New Matters Arising
  - The WG discussed the possibility of developing a webinar after the 2024 T&D meeting. A proposal was also made to work on a joint paper with PSRC K12.
  - A proposal was made to hold a lessons learned meeting after ballot completion to document ideas for improvement of future standards activities.
  - A reminder was made to ensure the standard recognized the contributions from Hubert Bilodeau before his retirement.
- Next meeting & Adjournment
  - Ad hoc for comment resolution and eventual webinar/paper development

Attendees:

Name	Membership	Affiliation
Mikael Halonen	Chair	Hitachi Energy
Joe Warner	Vice-Chair	POWER Engineers
Daniel Hill	VM	Amprion
Richard Oman	VM	Black & Veatch
David Langner	VM	Siemens Energy
Julie Lacroix	VM	Hydro Quebec
Sep Boshoff	VM	DNV
Tapan Manna	VM	Burns & McDonnell
Humayun Tariq	M	AEP
Andre Kostromsky	G	HICO
Humud Said	G	Burns & McD
Brandon Aalberg	G	BPA
Mark Mcchesney	G	Oncor
Ram Adapa	G	EPRI
Kamal Garg	G	SEL
Jonathan Goldberg	G	IEEE SA

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 01/09/2024.
- Officer presiding – Rick Gamble
- The meeting was called to order by the Chair.
- Introductions were made.
- The meeting was attended by 14 voting and 12 non-voting members.
- Quorum was met.
- January 2024 Agenda was approved.
- Meeting Minutes from September 2023 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 5th NES Com, allowing us to work until the end of 2025.
    - Schedule:
        - WG finishes work by end of 2024, including WG balloting.
            - Meeting invites will be sent out for March & April.
            - WG prefers Friday mornings.
        - Submit guide for balloting by early 2025.
        - WG resolves comments early to mid-2025 and resubmits.
        - Complete by end of 2025.
    - Discussed:
        - 46 directional element and possible future presentation.
        - Section 10 and aligning with 1036.
        - Section 8 Tables/Figures
            - Motion was approved to remove numbers in the Tables and ensuring calculation tools are readily available.
- WG Adjourn

Action Items:

- Secretary to submit author of analytical paper LOA.
- Ensure a voting members have access to iMeetCentral.
- Updated references from previous draft need to be translated to current draft.
- Revise 46 directional element section and schedule presentation.
- Align Section 10 with 1036.
- Update Tables/Figures in Section 8.

- Review Section 9.1
- Check in with K12/I9 Chair and how it effects Sections 9.3 & 9.4
- Check in with KTF32 Chair regarding Filter Banks

Attendees:

Name	Membership	Affiliation
Joel Ankeny	Guest	Pacificorp
Seth Barnes	Guest	TVA
Tim Condra	Guest	TVA
Stephen Conrad	Voting Member	Public Service Co of NM - Retired
Brandon Davies	Non-Voting Member	TRC
Kevin Donahoe	Guest	General Electric
Paul Elkin	Voting Member	TRC
Jack Fital	Guest	Entergy
Richard Gamble	Chair	TVA
Mat Garver	Vice-Chair	Beckwith Electric/Hubbell
Ethan Grindle	Guest	ATC
Jada Hawaz	Guest	SEL
Andrew Kunze	Voting Member	Minnesota Power
Brandon Lewey	Secretary	Ameren
Matthew Leyba	Guest	GE
Donald Lukach	Voting Member	Ameren
Tapan Manna	Voting Member	Burns & McDonnell
Pratap Mysore	Voting Member	Pratap Consulting Services LLC
Andrew Nguyen	Voting Member	Tennessee Valley Authority
Jyoti Pandey	Guest	Black & Veatch
Claire Patti	Voting Member	Portland General Electric
Juan Pineros	Voting Member	XM S.A. Colombia Power System Operator
Taylor Raffield	Voting Member	Duke Energy
Christopher Walker	Voting Member	Mesa Associates, Inc
Ted Warren	Non-Voting Member	Southern Co.
Avery Wood	Guest	Eaton

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: V 3.5, MEC Draft Copy After Recirculation 1

Assignment: Revise and update the C37.109 Guide

K26 did not meet. Draft guide is in SA editorial review and expected to be complete and published ahead of the May meeting.

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

24th WG Meeting

Meeting Notes:

- Patent slides were presented. No essential patents were identified.
- IEEE Copyright policy was presented.
- IEEE Participant behavior slides were presented.
- Call for quorum was made 10 of 18 members were present, 16 guests were present. Quorum was met.
- Brandon Davies motioned to approve the agenda. Jeff Barsch seconded, there was no discussion and motioned passed and agenda was approved.
- Final draft link/notification was sent to working group last week.
- A few final comments on figures were discussed:
    - Figure 14(c) – redrawn version was presented and discussed.
        - There was a discussion about the intent of the dashed voltages vs solid. This could be done in text or as a legend on the figure itself.
        - A suggestion was made to add a sentence clarifying that solid lines are measured (VT winding) and dashed are calculated.
        - Arrowheads on part C are not consistent with old version. Arrowheads should match the labels shown and only be shown on solid likes representing the VT windings. Remove arrowheads from dashed Wye phasors.
        - A suggestion was made to check the dashed line weight when the figure it inserted to make sure dashed lines show up clearly on a printed copy.
    - Figure 19 – New figure showing anti islanding added to this new revision. This figure was reviewed and discussed. No changes were suggested.
- Next steps for taking the draft guide to ballot were discussed.
- Motion to K committee to form an SA balloting body contingent on working group approval (by 2/3 majority) of draft 3.
    - Motion by: Brandon Davies
    - Second by: Jeff Barsch
    - 10 approved, 0 against, 0 abstentions
    - Motion passed
    - NOTE: This motion was brought up at K Subcommittee meeting and Approved
- Paul to check if a redline version is available on iMeet and if not, do a compare to the original copy to generate one and send a copy to the iMeet folder.
- A note was made that the draft number was incorrect on the latest draft. This will be updated using the macros in docm version of the document.
- Motion to adjourn, Ted W. second Neil S.
- Request a meeting room for 30 people in May 2024.

Attendance:

Name	Membership	Affiliation
Paul Elkin	Chair/Member	EPRO Engineering
Brandon Davies	Member	TRC
Jeff Barsh	Member	AEP
Jim Campbell	Guest	Southern Co.
Henry Qin	Guest	Entergy
Ram Viswanathan	Guest	Entergy
Ted Warren	Member	Southern Co.
Ryan McDaniel	Guest	SEL
Mathew Leyba	Guest	GE
Neil Saia	Member	Entergy
Todd Martin	Guest	Basler
Andy Kunze	Guest	MN Power
Alexis Mezco	Guest	TRC
Robert James	Member	PG&E
Ajmal Saed	Guest	PG&E
Stephen Pierce	Guest	ECI
Mark Adamiak	Guest	Adamiak Consulting
Steve Conrad	Member	Retired
Malia Zaman	Guest	IEEE SA
Dalisa Gonzalez	Guest	IEEE SA
Kevin Donahoe	Guest	GE
Charles Sufana	Guest	Retired
Juan Pineros	Member	
Steve Klecker	Member	Retired
Carolyn Sun	Member	
Paras Patel	Guest	TRC
Kevin Malpede	Guest	
Vincent Kwong	Guest	LCRA

Motion to K Subcommittee by Paul Elkin, Seconded by Ratan Das

Motion: *Working Group K27 motions to submit Guide PC37.95, IEEE Guide for Protective Relaying of Utility-Consumer Interconnections Draft 3 to IEEE-SA for Sponsor ballot contingent on working group approval of draft 3.*

Motion passed unanimously.

K29 WG: Write PES technical report based on K3 report entitled 'Reducing outage durations through improved protection and autorestoration in distribution substations'.

Chair: Sebastien Billaut

Vice Chair: Mohamed Zedeh

Secretary: Lalitha Devarakonda

Established: 2019

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

- Sebastien Billaut (Chair) is leading the meeting with introductions.
- Agenda is presented.
- Quorum is reached with 7 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 informed the chair that he would provide his contribution, though he has not been able to attend.
- Coleen Konsavage has informed that he cannot contribute on "Differential via direct input CT (instead of summed CTs)". Bernard Matta volunteered to contribute instead.
- Contribution was received from Bernard Matta related to "caution associated with REF, complexity, and misapplication".
- The following contributions are reviewed.
    - Scope of the report developed by the Chair. No comment is offered.
    - Mohammad Zadeh and Sudarshan B volunteered to review the contributions to REF.
- Don and Rafael Garcia will review the report and provide a contribution for the purpose of distribution bus configuration impact on reducing outage duration and see if they can provide a contribution.
- Motion to adjourn: First Brian Boysen, second Shudashan Byreddy, and approved.

Attendance:

Name	Membership	Affiliation
Sebastien Billaut	Chair	Commonwealth Associates Inc
Mohammad Zadeh	Vice Chair	ETAP
Bernard Matta	M	SEL
Sudarshan Byreddy	M	Burns and McDonnell
Brian Boyson	M	We Energies
Xuan Wu	G	AES
Corina Gutanu	G	ONCOR
William Cole Thompson	G	Black & Veatch
Rafael Garcia	M	ONCOR
Nathaniel Kamm	G	TRC
Don Ware	M (virtual)	Qualus

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: 2.3

Summary:

- Met with 19 in person attendees and 8 virtual attendees
- 11 of 19 Voting Members were in attendance - Quorum was achieved
- WG continues to progress through WG internal ballot comments – Roughly 65 % of overall comments have been completed since August 2023 (about 50% editorial, 50% technical).
- Approval of November web meeting minutes was completed

Details:

- Agenda was presented and reviewed – A motion to approve the agenda was made by Taylor Raffield and seconded by Gene Henneberg. No comments or discussion was made and the motion passed.
- 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 status of the working group ballot comment resolution. Four subgroups have been tasked with resolution of comments related to portions of the guide. Chair or vice Chair or both are in attendance of all subgroup meetings for continuity and efficiency of the subgroups.
- The working group expects to complete internal working group ballot comments before May PSRC meeting.
- Working group internal ballot comments were discussed.
    - Figure 29 and 30, comment to add disconnect switch and connection dots. Working group discussed that the disconnect switch was not material to the purpose of the Guide
    - Figure 30 – WG members agreed not to apply “dot convention” for intersect points unless it is necessary to avoid confusion.

Attendees discussed one of the comments related to “Dot Convention” for single line and single line relay diagrams. Purpose was to determine whether use of dot convention when two lines (on a single line drawing) cross for purpose of the BF Guide. Different opinions were expressed. Several of the drawings within draft 2.3 of the Guide were looked at. Also, one attendee referenced to a particular IEEE standard. The referenced IEEE standard supports both dot as well as no dot conventions. After the discussions, a motion was made by Mike Thompson, seconded by Gene Henneberg to retain the drawings (throughout the entire Guide) as originally drawn (2016 version of the Guide) and there is no need to make changes related to introducing dot convention. In case a Subgroup identifies a figure benefit from adding a dot convention, the Subgroup will assess to implement or to bring to the entire WG.

    - Figure 42 presentation was discussed. WG discussed this drawing is OK.
    - Figure 46 WG agreed to be redrawn, to address individual WG member comment.
    - WG members will coordinate for a web meeting possibly in late February, early March 2024.
- The meeting adjourned at 10:30AM CST.

Action Items:

- WG will coordinate a meeting for February-March timeframe
- Subgroups to continue with resolution of internal ballot comments

Attendance:

Name	Membership	Affiliation
Andrew Nguyen	TVA	NM
Austin Wade	SEL	NM
Brad Adams	LCRA	NM
Doug Edwards	Siemens	NM
Gary Stoedter	Electrical Reliability Services	NM
Henry H Quin	Entergy	NM
Jack Jester	Exelon Corp	NM
Jada Hawaz	SEL	NM
Joel Ankeny	PacifiCorp	NM
Kevin Donahoe	GE	NM
Kevin Malpede	ComEd	NM
Matthew Leyba	GE	NM
Nathanael Kamm	TRC	NM
Paul Nichols	Agbam Engineering	NM
Bernard Matta	SEL	VM
Brandon Davies (Vice Chair)	TRC	VM
Chris Walker	Mesa Associates	VM
Claire Patti	Portland General Electric	NVM
Don Ware	Qualus Corp	VM
Kamal Garg	SEL	VM
Michael Thompson	SEL Eng. Services	VM
Roger Whittaker	Retired	VM
Shivam Prabhakar	Siemens	VM
Steve Klecker	Retired	VM
Tayler Raffield	Duke Energy	NVM
Vahid Madani (Chair)	GridTology	VM
Yujie Yin	Quanta Technology	VM

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.

KTF32 did not hold a meeting, but plans to meet at May meeting.

KTF33: C37.234 Corrigendum for Ungrounded Bus Protection

Chair : Sebastien Billaut

Vice Chair : N/A

Output: Recommendation to K Subcommittee

Established: 2023

Assignment: Investigate the need to complement C37.234 chapter 8.3 on ungrounded

Meeting Notes:

- We met at 1:00 on January 9th, 2024, with six attendees.
- The Chair, Sebastien Billaut, performed a PSCAD simulation to show the impact of the broken delta resistor during restrike. The simulation showed a limited effect on the voltage build-up.
- In a second simulation, The Chair demonstrated that the phase capacitance unbalance is the criterion that drives the resistor sizing rather than the maximum capacitance. The group agreed it would be a good idea to consider issuing a correction to limit the scope of C37.234 chapter 8.3.
- We discussed various applications and concluded that this deserved additional consideration and that working on a report may be a better avenue to address the many scenarios that can present themselves.
- Ted Warren motioned to recommend forming a working group to work on a report and possibly issue a corrigendum to limit the scope of C37.234's existing content in Chapter 8.3.
- Koustubh Banerjee seconded the motion, and with no opposition, the recommendation passed.
- Through email, after the meeting, we received directions to present two motions using the motion powerpoint template.
- One motion would be:
    - "Motion to form a working group to create a PAR for a corrigendum to C37.234. The corrigendum will add a statement to limit the applicability of clause 8 to ungrounded systems with largely balanced capacitance to ground." Note: at SC K, This motion was moved to be made in the May 2024 meeting as an amendment rather than a corrigendum
- The second would be:
    - “Motion to form a WG to write a comprehensive report on the application of ground detection banks to ungrounded systems or systems that can become unintentionally ungrounded.”, Note at SC this motion passed the WG will be K35.

Attendance:

Name	Membership	Affiliation
Mike Thompson	SEL	Guest
Dereje Jada Hawaz	SEL	Guest
Looja Tuladhar	Daymark	Guest
Ted Warren	Southern Co.	Guest
Koustubh Banerjee	Eversource Energy	Guest
Sebastien Billaut (Chair)	Commonwealth Associates	Chair

KTF33 Motion to K Subcommittee by Sebastien Billaut, Seconded by Steve Conrad

Motion: *KTF 33 motions to form a working group to prepare a corrigendum to IEEE C37.234-2021 IEEE Guide for Protective Relay Applications to Power System Buses, with the scope of writing a corrigendum that will add a statement to limit the applicability of clause 8.3 to ungrounded systems with largely balanced capacitance to ground.*

In discussion of the motion, the sub-committee members questioned if a corrigendum was the appropriate method to update the C37.234 guide or if an amendment is more appropriate for this case as the suggested edits are not a direct correction of an error but provide more detail and context on this topic. As a result of this discussion, Sebastion rescinded the motion with the intent of the task force discuss these options with IEEE SA and bring a revised motion to the subcommittee at our next meeting.

KTF33 Motion to K Subcommittee by Sebastien Billaut, Seconded by Paul Elkin

Motion: *KTF 33 motions to form a working group to write a comprehensive report on applying ground detection banks to ungrounded systems or systems that can become unintentionally ungrounded.*

There was some discussion related to the scope of this report as it may include discussion of unintentionally ungrounded lines. Sebastion indicated that though some cases discussed may include lines, most of the applications that they plan to cover are within the substation. The motion passed unanimously, K35 will meet for the first time at the May meeting.

K34: Summary Paper C37.109 IEEE Guide for the protection of Shunt Reactors
Chair : Kamal Garg
Vice Chair : Ilia Voloh

Output: Summary Paper

Established: 2024

Assignment: Develop a summary paper for the updated C37.109 guide.

Meeting Notes:

- First meeting – Group consists of K26 main contributors and some new contributors. Total 18 members joined the K34 WG meeting on Jan 9 2024. Some other K26 active members could not K34 meeting due to schedule conflict.
- K26 Shunt reactor protection guide is "PC37.109 was approved as a revised standard by the IEEE SA Standards Board on 6 December 2023". Now guide is going through SA editorial review. Expected to be published by Q1 2024.
- Discussed the preliminary K34 outline by Ilia and Kamal
- Word document attached discusses the main leads writing the section. Most of the leads wrote the original sections in K26 shunt reactor guide.
- David Cavalry discussed some of the main content for section 5 and Appendix F to be added to summary paper.
- Pratap and Mukesh discussed content for line reactor section 6.1 and new section and protection enhancement.
- Gary Kobet will lead tertiary reactor section 6.2.
- Other volunteers including Taylor, David, Ritwik, Steve, Mukesh, Bill, Tapan are also added. (See the word document)
- Expecting first draft ready for discussion by May 2024 meeting.
- Adjourn 11:40 AM CST.

Attendance:

Name	Membership	Affiliation
Kamal Garg	Member	SEL
Gary Kobet	Member	TVA
Tappan Manna	Member	Burns & MacDonnell
Pratap Mysore	Member	Ulteig
Mukesh Nagpal	Member	Burns & MacDonnell
Ilia Voloh	Member	GE
David Caverly	Member	Trench
Ritwik Chowdhury	Member	SEL
Daniel Ransom	Guest	GE
Daine Nguyen	Guest	Entergy
Milton Quinteros	Guest	Entergy
Austin Penny	Guest	Entergy
Joel Ankeny	Guest	Pacificorp
Andrew Nguyen	Guest	TVA
Tim Condra	Guest	TVA
Seth Barnes	Guest	TVA
Nathanael Kamm	Guest	TRC
Van Le	Guest	WAPA

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

K Subcomittee Meeting Attendance

Name	Membership	Affiliation
Brandon Davies	Member	TRC
Charles Sufana	Member	Retired
Don Lukach	Member	Ameren
Jeff Barsch	Member	AEP
Kamal Garg	Member	SEL
Michael Thompson	Member	SEL Engineering Services
Mukesh Nagpal	Member	Burns & MacDonnell
Paul Elkin	Member	Epro Engineering
Ratan Das	Member	GE Consulting Services
Rick Gamble	Member	TVA
Sebastien Billaut	Member	CAI-engineering
Stephen Conrad	Member	Retired
Vahid Madani	Member	Self-Affiliated
William English	Member	Consumers Energy
Addis Kifle	GUEST	GTC
Alla Deronja	GUEST	American Transmisson Co.
Brandon Lewey	GUEST	Ameren
Byungtae Jang	GUEST	KEPCO, KR
Charles Henville	GUEST	Retired
Chris Walker	GUEST	Mesa Associates
Daniel Lebeau	GUEST	Hydro Quebec
David Caverly	GUEST	Trench
Dean Ouellette	GUEST	Quanta-Technology
Ding Lin	GUEST	Manitoba Hydro
Ethan Grindle	GUEST	ATC
Grady Denton	GUEST	MacLean Power Systems
Ian Tualla	GUEST	Duke Energy
Jack Jester	GUEST	Exelon Corp
Jason Eruneo	GUEST	Duke Energy
Jim O'Brien	GUEST	Duke Energy
Josh Lauletta	GUEST	Exacter inc
Joshua Hughes	GUEST	Qualus Corp
Juan Piñeros	GUEST	Colombia Power System Operator
Jun Verzosa	GUEST	Doble Engineering
Matt Garver	GUEST	Beckwith Electric
Matthew Leyba	GUEST	GE
Mike Basler	GUEST	Basler Electric
Muhammad Hamid	GUEST	Black & Veach
Nathanael Kamm	GUEST	TRC
Paras Patel	GUEST	TRC COMPANIES INC
Ravindranuath Ramlachan	GUEST	GE
Seth Barnes	GUEST	TVA
Tapan Mana	GUEST	Burns & MacDonnell
Tayler Raffield	GUEST	Duke Energy
Tedd Warren	GUEST	Southern Company
Tim Condra	GUEST	TVA
Xiangyu Ding	GUEST	S&C

Addendum B: PSRC January 2024 Meeting Agenda, Draft 7 (Final)

WG / URL		Output	IEEE SA reference	**MONDAY - JANUARY 8, 2024** **(All times are Central Standard Time, CST)**	CHAIR	EST	Room
				MONDAY - 8:00 AM - 9:10 AM			
A3		on-going		PSCCC Newcomer Orientation	James Formea	20	Napoleon C1
P5	*	Recd Practice		IEEE Std P1615 – Recommended Practice for Network Communication for Electric Power Substation Monitoring and Control	James Bougie	20	Maurepas
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 1/2)	Mark Adamiak	30	Napoleon B2
				MONDAY - 9:20 AM - 10:30 AM			
S19		Report		Review of DNP3 SAv6 and AMP	Andrew West	25	Grand Ballrm 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 2/2)	Mark Adamiak	30	Napoleon B2
				MONDAY - 10:40 AM - 11:50 AM			
C2	*	Standard		IEEE-C93.4 Standard for Power Line Carrier Line Tuning Equipment Associated with Power Transmission Lines	Dave McGuire	10	Maurepas
S11		Report		Task Force on Road Map Development for S0	Dan Goodlett	40	Grand Ballrm C
B4	#			PSRC Long Range Planning - Invitation only	Murty Yalla	10	Napoleon C1
				MONDAY - 11:50 AM - 1:00 PM LUNCH BREAK - on your own			
				MONDAY - 1:00 PM - 2:10 PM			
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	Maurepas
S14		Report		Study Group on HTTPS and TLS Exploration	Scott Lee	30	Grand Ballrm C
B1	#			Awards and Recognitions - invitation only	Andre Uribe	10	Napoleon C1
H49		Report		Application considerations for the Use of Packet-Switched Communication Channels for pilot protection and teleprotection schemes	Steve Klecker	30	Napoleon B2
				MONDAY - 2:20 PM - 3:30 PM			
A2TF/B2	#	on-going		Fellows Nominations - Invitation only	T.W. Cease / Jonathan Sykes	10	Napoleon C1
P14	*	Guide		WG: IEEE Std C37.236 – Guide for Power System Protective Relay Applications Over Digital Communication Channels	Tom Dahlin	30	Maurepas
S10		Report		TF: Utility & Municipality Challenges on Analyzing and Implementing Cybersecurity Standards and Best Practices	Jeff Pack	40	Grand Ballrm C
J17	*	Guide	C37.102	Revision of PC37.102, Guide for AC Generator Protection	Manish Das	40	Napoleon B2
				MONDAY - 3:40 PM - 4:50 PM			
A1		on-going		~~Awards and Recognitions~~ CANCELED	Hugo Monterrubio	10	Maurepas
P21/I49		Report		SG: System architectures supporting the virtualization of substation protection and control applications / Roadmap for developing new or updating existing IEEE standards to address issues of Centralized Protection and Control (CPC) Systems	Craig Preuss / Brian Mugalian	60	Grand Ballrm C
B	#			PSRC SC Chairs meeting - invitation only	Michael Thompson	15	Napoleon C1
SCASC				Synchrophasor Conformance Assesment Steering Committee (SCASC)	Allen Goldstein	15	Napoleon B2
				MONDAY - 5:00 PM - 6:10 PM			
P18/SCC21	*	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	25	Maurepas
S2	*	Standard		IEEE Std 1711.1 Standard for a Cryptographic Protocol for Cyber Security of Substation Serial Links: Substation Serial Protection Protocol (SSPP)	Edgar Cenzon	20	Grand Ballrm C
C23		On going		Coordination of Synchrophasor Related Activities	Yi Hu	20	Napoleon B2
I43		Report		EMP Resiliency	Angelo Tempone	30	Napoleon C1
				MONDAY - 6:00 PM - 10:00 PM - JTCM RECEPTION DINNER			

WG / URL		Output	IEEE SA reference	**TUESDAY - JANUARY 9, 2024** **(All times are Central Standard Time, CST)**	CHAIR	EST	Room
				TUESDAY - 8:00 AM - 9:10 AM			
B3				Membership - PSRC Newcomer Orientation	Mal Swanson	20	Oak Alley
C38	*	Guide	2030.12	Design of Microgrid Protection Systems	S. S. (Mani) Venkata	60	Napoleon D123
D35		Report		Evaluation of Transmission Line Pilot Protection Schemes	Rick Gamble	50	Grand Ballrm C
D53				Report on distribution line protection practices survey	Muhammad Hamid	30	Maurepas
H50		Report		Requirements for Time Sources in Protection & Control Systems	Dean Ouellette	30	Napoleon B2
I32		Survey		A Survey of Protective System Test Practices	Andre Uribe	20	Rhythms II
I4		On Going		International Standards Development (IEC Advisory)	Eric Udren	15	Napoleon A3
J16	*	Guide	C37.101	Revision of PC37.101, Guide for Generator Ground Protection - DOUBLE SESSION (1 of 2)	Ryan Carlson	30	Napoleon B3
J27		Summary Paper		Summary Paper - Revision of PC37.106, Guide for Abnormal Frequency Protection for Generating Units	Bracy Nesbit	**15**	Napoleon B1
K12/SubsI9	*	Guide	C37.431.20	Guide for Prot Static VAR Compensators - Joint meeting with Substations I9 MEETS WITH SUBSTIONS I9 on MONDAY 1:00 PM in NOTTOWAY	Satish Samineni	~~20~~	~~Borgne~~
				TUESDAY - 9:20 AM - 10:30 AM			
P20	*	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	30	Bayside A
S16		Report		Study Group on Application of IDS and IPS to Electric Power Systems	Eugenio Carvalheira	20	Oak Alley
CTF51		Report		Investigate revising C37.117, Guide for the Application of Protective Relays Used for Abnormal Frequency Load Shedding and Restoration	Kevin Jones	15	Napoleon D123
D42	*	Guide	C37.113	Revise C37.113 (Transmission Line Guide)	Jeff Barsch	50	Grand Ballrm C
DTF52				Trasient Signal Based Line Protection	Normann Fischer	30	Maurepas
H31		Report		Common Protection & Control parameters for COMSET	Deepak Maragal	20	Napoleon B1
H40	*	Recd Practice	C37.1.2	Databases Used in Utility Automation Systems	Theo Laughner	15	Napoleon B2
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	Rhythms II
J16	*	Guide	C37.101	Revision of PC37.101, Guide for Generator Ground Protection - DOUBLE SESSION (2 of 2)	Ryan Carlson	30	Napoleon B3
J24		Report		Report on Synchronous Generator Disturbance Recording	Shane Haveron	10	Napoleon A3
K31	*	Guide	C37.119	Guide for Breaker Failure Protection of Power Circuit Breakers	Vahid Madani	35	Borgne
				TUESDAY - 10:40 AM - 11:50 AM			
C1	*	Guide		IEEE-643 Guide for Power-Line Carrier Applications	Tony Bell	20	Bayside A
S1	*	Standard		WG: IEEE Std 1686 Standard for Intelligent Electronic Devices Cyber Security Capabilities	James Formea	30	Oak Alley
C29		Report		Power System Testing Methods for Power Swing Blocking and Out of Step Tripping	Kevin Jones	15	Napoleon D123
C41		Report		Investigate performance requirements for Distribution PMUs	Ken Martin	20	Grand Ballrm C
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	Allen Goldstein	30	Maurepas
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	Napoleon B2
H52	*	Standard	C37.232	Common Format for Naming Time Sequence Data Files, C37.232, COMNAME	Ellery Blood	20	Napoleon A3
I31	*	Standard	P1613	Standard for Environmental and Testing Requirements for Devices with Communications Functions Used With Electric Power Apparatus	Brian Mugalian	20	Rhythms II
J25		Report		Report on Synchronous Condenser Protection	Jason Eruneo	**40**	Napoleon B3
J26		Summary Paper		Summary Paper - Modeling of Generator Controls for Coordinating Generator Relays	Juan Gers	30	Napoleon B1
K27	*	Guide	C37.95	Guide for the Protective Relaying of Utility-Consumer Interconnections	Paul Elkin	30	Borgne
K34		Summary Paper		Summary Paper for C37.109 Guide for the Protection of Shunt Reactors	Kamal Garg	20	Rhythms I
				TUESDAY - 11:50 AM - 1:00 PM LUNCH BREAK - on your own			

WG / URL		Output	IEEE SA reference	**TUESDAY - JANUARY 9, 2024** **(All times are Central Standard Time, CST)**	CHAIR	EST	Room
				TUESDAY - 1:00 PM - 2:10 PM			
P19		Report		SG: Universal Utility Data Exchange (UUDEX)	Scott Mix	20	Bayside A
C48		Summary Paper		Summary paper of C37.120 Guide for Protection System Redundancy for Power System Reliability	Alla Deronja	20	Napoleon B1
CTF47				Relay Modeling in Electromechanical Dynamic Simulations for Power System Dynamic Performance (PSDP) committee	Evangelos Farantatos	20	Napoleon D123
D51		Report		Protection Consideration for Single Phase Tripping and Reclosing of Distribution Lines	Brian Boysen	35	Grand Ballrm C
H30		Report		IEC 61850 User Feedback	Deepak Maragal	35	Borgne
H47		Report		Investigate Impact of Digital Comms on Prot & Control Applications	Mital Kanabar	30	Napoleon B2
HTF55		Report		Investigate Distributed Cyber Physical Assesment for Grid Resilience	Jeff Pack	20	Napoleon A3
I37	*	Standard	PC37.90	Review of Standard for Relays and Relay Systems Associated with Electric Power Apparatus	Marilyn Ramirez	20	Rhythms II
I48	*	Guide	PC37.103	Revision of IEEE C37.103 Guide for Differential and Polarizing Relay Circuit Testing	Mohit Sharma	15	Rhythms I
J15		Report		Investigation of the criteria for the transfer of motor buses	Wayne Hartmann	30	Napoleon B3
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	Maurepas
				TUESDAY - 2:20 PM - 3:30 PM			
P2	*	Standard		WG: IEEE Std 1815 – Standard for Electric Power Systems Communications-Distributed Network Protocol (DNP3)	Ronald Farquharson	25	Bayside A
S17		Report		Task Force on Use of SBOM in the Energy Sector	Eric Thibodeau	25	Oak Alley
C45		Report		Protection and short-circuit modeling of systems with high penetration of inverter-based resources	Ali Hooshyar	60	Napoleon D123
D37		Report		Impact of series compensation on transmission line protection	Mike Kockott	25	Napoleon B2
D38		Report		Impact of High SIR on Line Relaying	Chris Walker	40	Grand Ballrm C
DTF54				Evaluate creation of a report on protection methods utilized on compensated neutral grounded distribution systems	Russ Patterson	30	Maurepas
H27	*	Standard	C37.251	File format for IED configuration Data (COMSET)	Mario Capuozzo	30	Borgne
H41	*	Standard	1646	Communication Delivery Time Performance Requirements	Dave Dolezilek	15	Napoleon A3
I41	*	Standard	PC37.90.3	Review of IEEE C37.90.3 - IEEE Standard Electrostatic Discharge Tests for Protective Relays	Steve Turner	20	Rhythms II
JTF28				Prepare J6, J14 papers for publication	Zeeky Bukhala	**10**	Napoleon B3
KTF32		Task Force		~~Explore the need for a separate guide for protecting Harmonic Filter Banks~~ CANCELED	Satish Samineni	20	Napoleon B1
				TUESDAY - 3:40 PM - 4:50 PM			
S15	*	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	Oak Alley
C52	*	Guide		Revise standard C37.246 IEEE Guide for Protection System of Transmission-to-Generation Interconnections.	Melvin Moncey	40	Napoleon D123
D29		Tutorial		Tutorial for Setting Impedance-Based Power Swing Relaying on Transmission Lines	Kevin Jones	15	Maurepas
D45		Report		Reduction of Forest Fire Hazzard	Jon Sykes	50	Grand Ballrm C
H6		Summary Paper		Application Testing of IEC 61850 based Systems	Charlie Sufana	30	Napoleon B2
I44		Report		Skills Required to Program, Commission, Test, and Maintain Ethernet Based PAC Systems	Andre Uribe	20	Rhythms I
I47 S18	*	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 S18 IEEE Standard Common Format for Documenting IED Firmware or Software Changes and confirming their Transmittal (COMFIRM) - Review and determine need of revision of IEEE C37.231 2006 IEEE Recommended Practice for Microprocessor Based Protection Equipment Firmware Control -- Joint with I47	Milton Quinteros / Éric Thibodeau	20	Rhythms II
J23		Report		Report on Generator Condition Monitoring	Steve Turner	20	Napoleon B3
K25	*	Guide	C37.99	Guide for the Protection of Shunt Capacitors	Rick Gamble	25	Borgne
K29		Report		Reducing outage durations through improved protection and autorestoration in distribution substations	Sebastien Billaut	20	Napoleon B1
				TUESDAY - 5:00 PM - 6:30 PM			
B	#			PSRC Adcom - by invitation only - until 6:30 PM		30	Napoleon D123

WG / URL		Output	IEEE SA reference	**WEDNESDAY - JANUARY 10, 2024** **(All times are Central Standard Time, CST)**	CHAIR	EST	Room
				WEDNESDAY - 8:00 AM - 9:10 AM			
P10	*	Standard		WG: P2664 – Standard for Streaming Telemetry Transport Protocol	Ken Martin	20	Bayside A
P13		Report		TF: Beginners guide to IEC 61850	Eugenio Carvalheira	30	Bayside BC
B11		On going		SC21 Distributed Resources Standard Coordination - OPEN TO ALL	Ben Kazimier	20	Napoleon C23
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	Napoleon D123
D43		Report		Update PSRC Report "Effect of DA on Protective Relaying"	Greg Ryan	30	Maurepas
D47	*	Guide	C37.243	Guide for Application of Digital Line Current Differential Relays Using Digital Communication	Alla Deronja	40	Napoleon A123
H46	*	Recd Practice	C37.1.3	HMI used in Substation Automation Systems	Matt Black	30	Napoleon B12
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	Rhythms II
J22	*	Guide	C37.96	Revision of PC37.96, Guide for AC Motor Protection	Zeeky Bukhala	30	Napoleon B3
				WEDNESDAY - 9:20 AM - 10:30 AM			
E0				~~Wire Line Subcommittee~~ CANCELED	John Fuller	50	Bayside BC
S8	*	Guide		WG: IEEE Std 2658 Guide for Cybersecurity Testing in Electric Power Systems	Nathan Wallace	20	Oak Alley
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	Napoleon C23
D44	*	Guide	C37.114	Revise C37.114 (Fault Location Guide)	Sebastien Billaut	30	Napoleon A123
DTF55				Protection of HVDC systems and dc distribution systems	Brandon Lewey	30	Maurepas
H44	*	Guide	C2030.101.1	Monitoring & Diag IEC 61850 GOOSE and Sampled Values Based Systems	Aaron Martin	40	Napoleon D123
H45	*	Guide	C37.300	Guide for Centralized Protection & Control (CPC) Systems within a Substation	Ratan Das	40	Napoleon B12
I45		Report		Grounding and Bonding Issues Associated With Substation Wiring Practices and Instrumentation	Adrian Zvarych	20	Rhythms II
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	Rhythms I
ITF51		Paper		Evaluate interest in developing a summary paper for IEEE Std C37.110 Guide for the Application of Current Transformers for Protective Relaying Purposes	Michael Higginso	20	Bayside A
J21		Tutorial		Motor Protection Tutorial	Derrick Haas	30	Napoleon B3
				WEDNESDAY - 10:40 AM - 11:50 AM			
C0	C. Power Line Carrier, 3 Activ			Power Line Carrier Subcommittee	Tony Bell	50	Bayside BC
P16/H53	*	Standard		WG: Joint Work and Review of IEEE Std 1854 Guide for Smart Distribution Applications - Joint with H53	Craig Preuss / Xiangyu Ding	20	Bayside A
S7	*	Standard		WG: IEEE Std 2808 Standard for Function Designations used in Electrical Power Systems for Cyber Services and Cybersecurity	Nathan Wallace	20	Oak Alley
B10	#	On going		Inverter Based Resources Steering Working Group	Michael Thompson	15	Napoleon C23
C43		Report		Artificial Intelligence and Machine Learning technologies for power system protection and control applications	Yi Hu	50	Napoleon D123
D30		Tutorial		Application and Setting Mho/Quad Distance Elements on TLines	Karl Zimmerman	30	Maurepas
D48		Report		Single Phase Operations (Tripping and Reclosing) on Transmission Lines	Kamal Garg	30	Napoleon A123
I2		On Going		Terminology Usage Review	Mal Swanson	20	Rhythms II
I33		Report		~~Review of Relaying Testing Terms~~ CANCELED	Scott Cooper	10	Rhythms I
J20		Report		Report on Practices for generator synchronizing systems	Jason Eruneo	30	Napoleon B3
				WEDNESDAY - 11:50 AM - 1:10 PM LUNCH BREAK - on your own			
				WEDNESDAY - 1:10 PM - 2:35 PM			
F0				~~Fiber Optic Subcommittee~~ CANCELED	Del Khomarlou	50	Napoleon C23
C SC				Systems Protection Subcommittee	Michael Higginson	60	Napoleon A123
H SC				Relaying Communications and Control Subcommittee	Aaron Martin	75	Napoleon B12
				WEDNESDAY - 2:45 PM - 4:10 PM			
P0				Protocols and Architecture Subcommittee	Tom Dahlin	50	Napoleon C23
I SC				Protection and Control Practices Subcommittee	Ritwik Chowdhury	60	Napoleon A123
K SC				Substation Protection Subcommittee	Adi Mulawarman	50	Napoleon B12
				WEDNESDAY - 4:20 PM - 5:45 PM			
S0				Cybersecurity Subcommittee	Scott Mix	50	Napoleon C23
D SC				Line Protection Subcommittee	Meyer Kao	60	Napoleon A123
J SC				Rotating Machinery Subcommittee	Will English	40	Napoleon B12

WG / URL		Output	IEEE SA reference	**THURSDAY - JANUARY 11, 2024** **(All times are Central Standard Time, CST)**	CHAIR	EST	Room
				THURSDAY - 7:30 AM - 10:45 AM			
PSRC MC				PSRC Main Committee Meeting	Michael Thompson	220	Napoleon B123
				THURSDAY - 11:00 AM - 1:00 PM			
PSCC MC				PSCCC Main Committee Meeting	James Formea	85	Napoleon B123
				Groups not meeting Jan 2024			
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 meeting Jan 2024
P11		Report		TF: Cloud Computing, uses and Requirements of Electric Power Utilities	T.W. Cease		no meeting Jan 2024
P12		Report		TF: Analog Leased Line End of Life and Migration	Marc Benou		no meeting Jan 2024
P17				.....			no meeting Jan 2024
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		no meeting Jan 2024
P4				.....			no meeting Jan 2024
P6		Report		Application of Ethernet Networking Devices Used for Protection and Control Applications in Electric Power Substations	Eric A. Udren		no meeting Jan 2024
P7				.....			no meeting Jan 2024
P8		Report		TF: Recommended Mapping Approach between IEEE C37.118.2 and IEC 61850	Yi Hu		no meeting Jan 2024
P9/C40	*	Standard		WG: IEEE Std C37.118.2 – Standard for Synchrophasor Data Transfer for Power Systems - Prepare a tutorial from the work of C37.247 Standard for Phasor Data Concentrators - Joint with C40	Vasudev Gharpure	20	no meeting Jan 2024
S13	*	Guide		WG: Joint Work on IEEE Std 1547.3 Guide for Cybersecurity of DERs Interface with Electric Power Systems	Tony Johnson		no meeting Jan 2024
S3	*	Standard		WG: IEEE Std 2030.102.1-2020 – IEEE Standard for Interoperability of Internet Protocol Security (IPsec) Utilized within Utility Control Systems			no meeting Jan 2024
S4	*	Standard		IEEE Std 1711.2-2019 – IEEE Standard for Secure SCADA Communications Protocol (SSCP)			no meeting Jan 2024
S5	*	Standard		WG: IEEE Std C37.240 – Standard Cybersecurity Requirements for Power System Automation, Protection and Control Systems	Steven Kunsman		no meeting Jan 2024
S9		Report		TF: Task Force on Utility IT-OT Cybersecurity Challenges in Roles and Terminology	Theo Laughner	30	no meeting Jan 2024
C33	*	Rec'd Prac	2004	HIL Simulation Testing Power Apparatus & Ctrl	Dean Ouellette	40	no meeting Jan 2024
C39	*	Guide	C37.252	Guide for Testing Automatic Voltage Control Systems in Regional Power Grids	Xiaopeng Li	20	no meeting Jan 2024
C40/P9		Tutorial		Prepare a tutorial from the work of C37.247 Standard for Phasor Data Concentrators - joint with P9	Vasudev Gharpure	10	no meeting Jan 2024
D34				Coord w/ IEC 60255-187-3 Functional Spec for Line Current Diff Req	Normann Fischer	N/A	no meeting Jan 2024
D50		Paper		Summary Paper for C37.104 Guide for Automatic Relcosing on AC Distribution and Transmission Lines	Manish Patel		no meeting Jan 2024
H17		Report		Establishing Links between COMTRADE, IEC 61850, and CIM	Christoph Brunner	20	no meeting Jan 2024
H22	*	Guide	C37.249	Guide for Cyber Security for Protection Related Data Files	Amir Makki	20	no meeting Jan 2024
H51	*	Standard	C37.239	COMFEDE Revision	Mark Admiak	15	no meeting Jan 2024
I26		Report		Mathematical Models of Instrument Transformers	Mike Meisinger	30	no meeting Jan 2024
I36	*	Standard	PC37.90.2	Revision of - Standard for Relays, Relay Systems, and Control Devices used for Protection and Control of Elec	Chase Lockhart	20	no meeting Jan 2024
K26	*	Guide	C37.109	Guide for the Protection of Shunt Reactors	Kamal Garg	N/A	no meeting Jan 2024

Power System Relaying and Control Committee
PSRC Main Committee Meeting Agenda
Thursday, January 11, 2024 7:30 AM - 10:45 AM (CST)

I.	Call to Order/Introductions/Quorum	Mike Thompson
II.	Approval of September 2023 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	
	H - Relay Communications	Aaron Martin
	I - Protection and Control Practices	Ritwik Chowdhury
	J - Rotating Machinery	Will English
	K - Substation Protection	Adi Mulawarman
	C - System Protection	Michael Higginson
	D - Line Protection	Meyer Kao
VI.	Presentations	Jim Niemira
a.	IEEE C37.104 IEEE Guide for Automatic Reclosing on AC Distribution and Transmission Lines	Manish Patel
b.	IEEE 1547.2 Application Guide for IEEE 1547-2018	Wayne Stec

VII. Old Business

VIII. New Business

IX. Announcements

X. Adjourn