POWER SYSTEM RELAYING AND CONTROL COMMITTEE
of the IEEE POWER AND ENERGY SOCIETY
MINUTES of the MEETING in Myrtle Beach, South Carolina, USA

September 18-21, 2023, In-Person Meeting held at DoubleTree Resort by Hilton Myrtle Beach Oceanfront, Myrtle Beach, SC, 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 (EDT) on Thursday, September 21, 2023.

Following tradition, attendees introduced themselves. First time attendees reintroduced themselves and were recognized. A quorum check was conducted and verified that quorum was achieved. There are 135 Main Committee Voting Members. PSRC Rules require 50% attendance for quorum for groups larger than 50, so 68 Voting Members constitute quorum. There were 72 Main Committee Voting Members present of 135 Main Committee Voting Members, so quorum was achieved. Attendance was recorded via in-person sign-in sheets. Attending this Main Committee meeting were 142 people in person, 72 Main Committee Voting Members and 70 guests.

There were no objections or additions to the previously published meeting agenda.

REMINDER:

New Officers took over starting from January 2023. Please update your contacts lists to ensure your emails go to the appropriate officer.

PSRC Chair -- Michael Thompson, chair@pes-psrc.org

PSRC Vice Chair -- Gene Henneberg, vice_chair@pes-psrc.org

PSRC Secretary -- Jim Niemira, secretary@pes-psrc.org

Chair's Report - Michael Thompson

The September 2023 joint meeting of the PSRC and PSCC Committees at the DoubleTree, Myrtle Beach Oceanfront Resort, in Myrtle Beach, SC went very well. The venue and weather aligned well with our efforts to help our participants enjoy meeting face-to-face again after the global pandemic. We are pleased to report that the attendance was strong. We had 257 participants including 25 newcomers. The break down in participants at this meeting is shown below.

Committee	Returning	New Attendees	Total
PSCCC	12	4	16
PSRC	137	16	153
Both	83	5	88
Total	232	25	257

The PSRC is making an effort to improve the amenities associated with our in-person meetings. I hope all found the welcome/awards banquet and breaks to be very nice at this meeting. We will continue to refine our approach to find a happy medium between registration fees and amenities. We also had two additional enrichment events: A Lunch and Learn on Tuesday presented by Gary Kobet and Pratap Mysore on real world experiences with shunt reactors; and an informational presentation on Wednesday evening on Cyber-Informed Engineering put on by Idaho National Labs.

This meeting was fully in-person for PSRC and fully hybrid for PSCC. I just want to reiterate PSRC's intention to support hybrid participation at one of our three full meetings each year. The upcoming Joint Technical Committee Meeting (JTCM) in January in New Orleans, LA will be our hybrid meeting. Both in-person and remote participants will be required to register for the JTCM. It should be noted that remote registration will be cutoff on January 2, 2024. The early cutoff is to facilitate distribution of the remote meeting access password. In the past, we have had participants register after the remote deadline and then be unhappy that they were not able to access the meetings.

Again, I request all participants and interested individuals log into the MemberPlanet portal (link available on the pes-psrc.org membership page) to create a profile. It appears that we are well below 50% compliance with this request. The system rollout is way behind schedule but as soon as they are ready, we will transition our process to use this tool to communicate with participants, track rosters and participation, and collaborate on our important work as soon as possible. We would hate to lose touch with any one of you.

Since the last meeting, we lost two contributors to our industry. We recognize the contributions of Zitao "Peter" Wang who passed away in July, 2023, and Michael (Mischa) Steurer, who passed away in August, 2023. We are grateful to them for giving their talents and energy to the betterment of society.

Thank you to everyone for making our September 2023 meeting a success. I look forward to seeing you all in New Orleans, LA for our January meeting.

Sincerely,

Michael Thompson

II. Approval of Minutes / Financial Report: Jim Niemira

Minutes of the May 2023 PSRC in-person meeting held in Las Vegas, NV, were posted to the PSRC website for review. A motion to approve the Minutes of the May 2023 meeting as posted was made by Jonathan Sykes and seconded by Farnoosh Rahmatian. The Motion to Approve May 2023 Minutes passed unanimously.

Total registration for both PSCCC and PSRC for the September 2023 meetings is at 257, roughly the same as in-person registration of 260 in May 2023. The September 2023 PSRC

meetings were in person only, although some WG and the PSCCC also supported on-line attendance. On-line attendance is not recorded in the registration statistics. Refer to the Chair's report for breakdown of attendance statistics for the May 2023 meeting.

The PSRC committee financial status is healthy. Registration fees were increased approximately 25% for the September 2023 meeting to be more in line with actual costs. The goal is run meetings near revenue neutral where fees are reasonable and adequate to cover expenses while maintaining an appropriate operating reserve that will cover emergencies. Fees for future meetings will be adjusted in accordance with anticipated revenues and expenses.

Many thanks to meeting sponsors Omicron, SEL, and S&C Electric Company for contributions towards refreshments for the meetings, and many thanks to Idaho National Laboratories for hosting the Cyber Informed Engineering event. Contributions from these donors were significant towards making this meeting break even financially.

Also, thanks so much to those who donated use of projectors for the meetings which helps to keep meeting costs down.

I also need to thank Melania Thompson for her assistance in planning the meeting refreshments and banquet menu; Gary Kobet and Pratap Mysore for making the Lunch and Learn presentation on Tuesday; and the DoubleTree staff and Encore A/V crew for their prompt and friendly responsiveness to our needs.

Association Management System Update – Gene Henneberg

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.

Post Pandemic Meeting Plans and Future Meetings – Gene Henneberg

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:

January 7–11, 2024 (Hybrid Format with JTCM), New Orleans, LA, Sheraton New Orleans

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 information yet.

We are considering venues across the USA, west, central, and east, for the PSRC meetings.

III. Reports of Interest

A. Technical Paper Coordinator's Report: Gene Henneberg

GM 2023 (In Person Meeting, July 16 to 20, Orlando, FL) -- > 2900 attended

- 4 PSRC Panel sessions
  - Integrating Relay Models with RMS Dynamic Simulations – Protection Perspective, Evangelos Farantatos, Session Chair (40 attended)
  - Developing AI/ML applications for power system protection & control – Opportunities and Challenges, Yi Hu, Session Chair (63 attended)
  - Augmenting power system protection & control – Industry perspectives and case studies of practical AI/ML applications, Abder Elandaloussi, Session Chair (42 attended)
  - New developments to mitigate power line induced wildfire ignitions, Jonathan Sykes, Session Chair (24 attended)
- 21 Papers Accepted
  - 2 papers nominated as the best PSRC papers
  - 6 papers selected for the paper forum

IEEE PES T&D Conference & Exposition – May 6-9, 2024, Anaheim, CA

- PSRC has requested one 8-hour tutorial
  - Inverter Based Resource (IBR) Short Circuit Modeling – Evangelos Farantatos (chair), Sukumar Brahma, Aboutaleb Haddadi, Sherman Chan, Mohammad Zadeh, Yazid Alkraimeen

- PSRC has requested 5 two-hour panel sessions
  - Augmenting traditional utility P&C approach with AI/ML for Solving Challenges for the grid of the Future--Abder Elandoussi (chair), Sukumar Brahma, Yi Hu, Joerg Blumschein
  - Wildfire Mitigation for Electrical Power Systems--Jonathan Sykes (chair), Daqing Hou, Jeff Dagle, Hugh Borland, Dan Ransom

- Inverter Based Resource (IBRs) Interconnection and Penetration Issues --Jonathan Sykes (chair), Jason Eruneo, Rich Bauer, Paul Martini, Juergen Holbach, Bogdan Kazstenny
- Industry Viewpoints on IEC 61850--Rich Hunt (chair), Phil VanSat, Bill Winters, John Bettler, John Hart
- Improving Protection of Low-Voltage Networks with High DER—Matt Reno (chair), Zheyuan Cheng, Chris Jones, Aadityaa Padmanabhan, Juval Bothe, Joseph Azzolini

- 7 papers submitted for PSRC review

Technical Paper Reviewer Volunteers

A reminder for all Main Committee members: *Reviewing papers for IEEE Transactions and Conferences is a responsibility of all Main Committee Members.*

Many thanks to the 66 volunteer Paper Reviewers:

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

IEEE PES 2024 General Meeting -- July 21-24, 2024, Seattle, WA

- THE NEW ELECTRIC SYSTEM: REINVENTION AND RESILIENCE
  - 10953-2024-GM-Flyer-Digital.pdf (pes-gm.org)
  - Call for papers opens Oct 3, must be submitted by Nov 8
  - Requests for panels must be submitted by Nov 8 (one tentative PSRC panel so far)

IEEE PES GM 2024 Super Sessions

Where does your subject of interest fit?

- 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

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

Nothing to report at this time.
B5 met a few days ago in Australia.
Expect report at the January 2024 PSRC meeting.

The next US CIGRE NC Meeting will be held
Oct 9-12, 2023 in Kansas City, MO. The paper deadline has passed. Further details may be found at: https://cigre-usnc.org/grid-of-the-future-2023/

C. IEEE PES Report – Michael Thompson

Nothing to report at this time.

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

SC21 Standards Update – Overview on 1547 series and recently launched projects

IEEE 1547-2018: Standard for Interconnection

IEEE 1547a-2020: Amendment to widen allowable ranges for abnormal voltage trip settings of Category III DER

IEEE P1547rev: Revision of 1547-2018

IEEE P1547.1a: Amendment of DER interconnection test and verification requirements

IEEE P1547.2: Application Guide to IEEE 1547-2018

IEEE 1547.3-2023: Guide for Cybersecurity of Distributed Energy Resources Interconnected with EPS

IEEE P1547.4: Islanded Systems (Microgrids) – PAR in development

IEEE 1547.7-2013: Guide to Conducting Impact Studies for Distributed Energy Resource Interconnection ***draft PAR for revision under development***

IEEE 1547.9-2022: Guide for Energy Storage System Interconnection

IEEE P1547.10: Recommended Practice for Distributed Energy Resources (DER) Gateway Platforms

IEEE 2030 Projects – Active Projects (PARs)

IEEE P2030; Smart Grid Interoperability (Revision of IEEE Std 2030-2011)

IEEE Std 2030.2-2011; Energy Storage Systems Interoperability

IEEE P2030.2.1; Design, and O & M of Battery Energy Storage Systems

IEEE P2030.3; Test Procedures for Electric Energy Storage Equipment and Systems

IEEE P2030.4; Guide for Control and Automation Installations Applied to the Electric Power Infrastructure

IEEE P2030.5; a protocol that has been instrumental in integrating interoperability into California

IEEE 2030.7-2017; Standard for the Specification of Microgrid Controllers

IEEE 2030.8-2018; Standard for the Testing of Microgrid Controllers

IEEE P2030.9; Recommended Practice for the Planning and Design of the Microgrid

IEEE 2030.10-2021; IEEE standard for DC Microgrids

IEEE P2030.10.1; Standard for Electricity Access Requirements with Safety Extra Low Voltage (SELV) DC for Household Electricity Supply

IEEE 2030.11-2021; Guide for DERMS (Aggregation of DER)

IEEE P2030.12; Guide for Protection of Microgrid Systems

IEEE P2030.13; Guide for Electric Transportation Fast Charging Station Management System Functional Specification

New SC21-Sponsored IEEE Industry Connection "Electric Energy Resources Interconnection Standards Collaborative (ISC) " —Scope and Mission—

The ISC encourages collaboration across IEEE Committees managing the development of standards for the interoperability and interconnection of distributed energy resources (DERs) with the grid and the entities that reference and apply these standards. Targeted standards in scope are the IEEE 1547 series that specify technical minimum performance capabilities and functional requirements for generation and storage resources interconnected to distribution grids. The goal is to deliver IEEE 1547 standards to ready DERs with capabilities that enable future utilization with increasing DER penetrations and to support industry stakeholders in the adoption of these standards.

The ISC is open to any stakeholders with subject matter expertise or strategic interest.

IEEE 1547-2018 Protection Challenges (including field experience)

- Coordinating protection with Ride Through
- Short Circuit (rotating machines contribute, inverters limited)
- Configuration of Interconnection System
  - Transformer
  - PCC recloser
  - Open phase conditions
- High Penetration of DER
  - Load Rejection Overvoltage
  - Ground Fault overvoltage
  - Islanding
  - Reverse Power Flow (substation, feeder, recloser miscoordination)
  - Protection coordination
  - Fault duty

P1547rev DEFINED TERMS

Potential revisions to "Trip"

IEEE 1547-2018 Definitions:

cease to energize: Cessation of active power delivery under steady-state and transient conditions and limitation of reactive power exchange.

NOTE 1—This may lead to momentary cessation or trip.

NOTE 2—This does not necessarily imply, nor exclude disconnection, isolation, or a trip.

[…]

return to service: Enter service following recovery from a trip.

trip: Inhibition of immediate return to service, which may involve disconnection.

NOTE—Trip executes or is subsequent to cessation of energization.

Proposal #1:

Replace "trip" with "exit service"

exit service: Inhibition of immediate return to service, which may involve disconnection.

NOTE—Exit service [may] execute[s] or [is | be] subsequent to cessation of energization.

Ride-Through Requirements & Clarifications -- Existing language and proposed revisions:

EXISTING:

Clause 1.4 - General remarks and limitations

Refer to the text starting with…

The following list describes what remains outside the scope of this standard:

Existing 9th bullet in list…

- **The lower and upper values of the ranges of allowable settings for voltage and frequency trip settings specified in this standard for DER are not intended to limit the capabilities and settings of other equipment on the Area EPS.**[9]

  with:

  Footnote 9: Refer to footnotes 80 and 99 on **recommendations for utility practices to use trip settings on Area EPS equipment** that conflict with this standard to occasionally and selectively accommodate worker safety practices or to safeguard distribution infrastructure while in an abnormal configuration.

6.4.1 Mandatory voltage tripping requirements

Footnote 80: The lower and upper values of the ranges of allowable settings for voltage and frequency trip settings specified in this standard for DER are not intended to limit the capabilities and settings of other equipment on the Area EPS. **It is recommended that settings applied on Area EPS equipment conform to the voltage and frequency ride-through objectives of this standard whenever the Area EPS is in normal configuration.** However, it is recognized that in certain cases Area EPS operators may need to occasionally and selectively use trip settings outside the ranges of allowable settings to accommodate worker safety practices or to safeguard distribution infrastructure while in an abnormal configuration, e.g., during automatic reconfiguration of a circuit section or temporary loss of direct transfer trip of mid- and large-scale DER. **Area EPS operators should limit trip settings on Area EPS equipment that conflict with this standard to only affect those selective DER and Area EPS equipment and only for a limited period necessary to meet these worker safety and equipment protection goals. Area EPS operators should coordinate these practices with the regional reliability coordinator who may consider bulk power system impacts of affected aggregate DER capacity.**

6.5.1 Mandatory frequency tripping requirements

Footnote 99: *[same as Footnote 80 above]*

PROPOSED SG1/SG3 Edits (existing language with additional language in RED)
Promote clarifications from existing informative footnote into normative language of the standard

Clause 1.4 Proposal - General remarks and limitations

Refer to the text starting with…
The following list describes what remains outside the scope of this standard:
Existing 4th bullet in list…

- This standard does not address planning, designing, operating, or maintaining the Area EPS with DER.
- This standard **does not address** system protection schemes or protection devices applied by the Area EPS owner. ##

Footnote ## It is recommended that settings applied on Area EPS equipment conform to the voltage and frequency ride-through objectives of this standard whenever the Area EPS is in normal configuration. **The Area EPS operator should consider utilizing protection schemes that selectively identify faults within protection zones providing exclusive connectivity between a DER and the Area EPS / BPS** and should not unnecessarily cause a DER to be unable to meet the requirements of this Standard.

Clause 6.[4 & 5].2 Proposal – [Voltage & Frequency] disturbance ride-through requirements
6.[4 & 5].2.1 General requirements and exceptions

Refer to the text in the existing 4th paragraph…
The **[voltage & frequency] disturbance ride-through** specified in the remainder of 6.4.2 **shall not apply** and DER may *cease to energize* the Area EPS and trip without limitations **if any of the following applies**:

a) The **net active power exported** across the *point of common coupling* into the Area EPS is continuously maintained at a value less than 10% of the aggregate rating of DER connected to the Local EPS prior to any voltage disturbance, and the Local EPS disconnects from the Area EPS, along with Local EPS load to intentionally form a Local EPS island, or

b) An **active power demand** of the Local EPS load equal or greater than 90% of the pre-disturbance aggregate DER active power output **is shed within 0.1 s** of when the DER ceases to energize the Area EPS and trips.

c) **Faults within the DER** that cannot be cleared except by disconnecting the DER from the Area EPS.

d) **During unintentional islanding** or any system event for which the protective action results in an unintentional island.

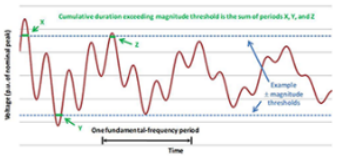
e) **An Area EPS protection system directs the DER** or Local EPS **to disconnect** or cease to energize and trip from the Area EPS.

Outlook on transient overvoltage ride-through requirements:
Incorporate parts of IEEE 2800-2022 for “DER systems”?. (To prevent trips during momentary transient voltage excursions)

IEEE 1547-2018 Clause 7.4.2—Limitation of cumulative instantaneous overvoltage

The DER shall **not cause the instantaneous voltage** on any portion of the Area EPS to exceed the magnitudes and cumulative durations shown in Figure 3. The cumulative duration shall only include the sum of durations for which the instantaneous voltage exceeds the respective threshold over a one-minute time window.[126]

[126] Cumulative duration is illustrated as follows:



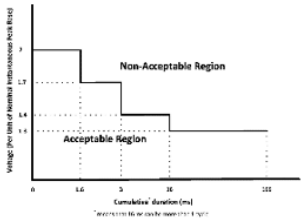


Figure 3—Transient overvoltage limits

IEEE 2800-2022 Clause 7.2.3 Transient overvoltage ride-through requirements

The *IBR plant* shall **ride through transient overvoltage** that do not exceed the fundamental-frequency overvoltage ride-through requirements specified in 7.2.2.1 and for which the greater of individual phase-to-phase or phase-to-ground instantaneous voltage magnitudes do not exceed the cumulative durations (minimum time) specified in Table 14. […]

Table 14—Transient overvoltage ride-through requirements at the RPA

Voltage[c] (p.u.) at the RPA	Minimum ride-through time (ms)[d] (design criteria)[b]
V > 1.80	See footnote[c]
V > 1.70	0.2
V > 1.60	1.0
V > 1.40	3.0
V > 1.20	15.0

[a] Appropriate surge protection shall be applied at the RPA as well as within the *IBR plant*, including *IBR unit* terminals (POC), as necessary.
[b] The minimum ride-through times specified in Table 14 apply to both 50 Hz and 60 Hz systems.
[c] Specified voltage magnitudes are the residual voltages with surge arresters applied.
[d] Cumulative time over a 1-min time window.

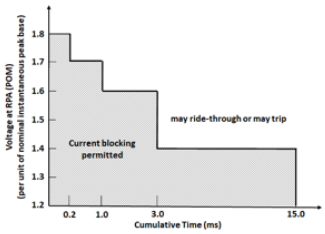
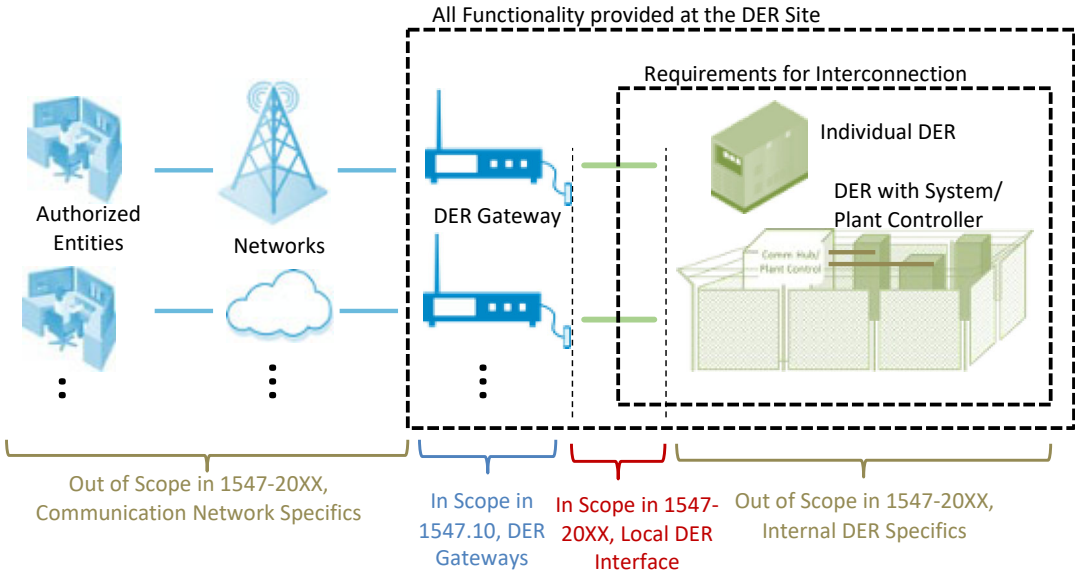


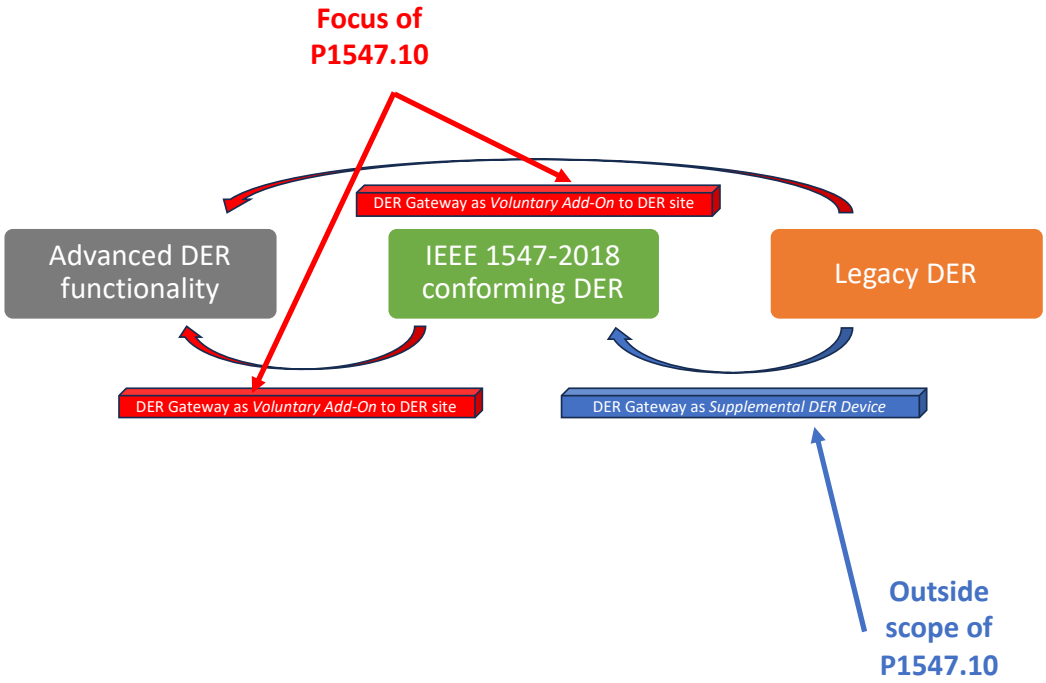
Figure 11—Transient overvoltage ride-through requirements for IBR plant (informative)

IEEE 1547 Rev WG Task Forces
Possible proposal for formation of Protection TF
IEEE PSRC has requested that the IEEE 1547-2018 Rev WG consider creating a Protection Task Force (TF3) to review protection issues related to IEEE 1547-2018 and coordinate with other sub-groups.

Potential creation of a Protection TF for IEEE 1547-2018 Rev is pending a formal submission of a proposal for TF and vote by IEEE 1547-2018 Membership
Proposal must include: Statement of purpose and need, Scope of Task Force, Lead for Task Force

Demarcation between IEEE P1547 vs. IEEE P1547.10
"A DER Gateway [Platform] is a set of advanced functions such as intelligence, monitoring, control, protocol translation and cybersecurity at the grid-edge, that augments IEEE 1547."





Call to Action for IEEE PSRC Members
Upcoming IEEE 1547/.x WG Meetings
2023
3rd Full WG meeting in in Wilsonville, OR – Fall 2023 (In-person & Virtual)
Hosted by PGE @ 29353 Southwest Town Center Loop East, Wilsonville, OR, USA
Dates: Oct 2-5, 2023
Joint WG Meetings (P1547 Rev, P1547.10, P1547.4, P1547.1a)
Registration at https://events.bizzabo.com/530389

2024
1st Full WG meeting – Hybrid / FULLY VIRTUAL ? (Pending Final Decision)
Dates: March 4-8, 2024
Alternative Date: March 11-15, 2024
Joint WG Meetings (P1547 Rev, P1547.10, P1547.4, P1547.1a, etc.)

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.)

E. 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.
4 Standards published!
9 Standards with expiring PARS.
Revcom Approved P1646 yesterday (9/20/23).
3 on Nescom agenda.
SCs in process of extensions on remainder.

Update on O&P Manual
MOTION to adopt new O&P manual PSRCC_OP_DRAFT 2023-9-12.pdf that was sent by email to PSRC Voting Members for their review and comment on 9-12-2023. Motion made by Don Lukach; Seconded by Steve Conrad. **Motion passed unanimously**.
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 - Don Lukach
The PSRC performs a multitude of standard related work including 31 active PARs that the PSRC leads, several PARs in non-lead Joint Committee relationships, and 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 September meeting eight PARs will expire at the end of 2023. One is expected to be to REVCOM, four are on NESCOM agendas, and the other three have extension requests approved by their Subcommittees. The three just approved are expected to have the extension requests submitted in MyProject by the 10/16/23 submission date.

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*:*
Note that PC37.109 is expected to also be completed in 2023. The Guide is in ballot recirculation with the expectation to be submitted to REVCOM by the 10/16/23 submission date.

Project	Title	Chair	V Chair	WG	Status
C37.92	Standard for Analog Inputs to Protective Relays from Electronic Voltage and Current Transducers	Ritwik Chowdhury	Eric Udren	I38	SASB Approval 15FEB23 Published April 23
C37.110	Guide for the Application of Current Transformers Used for Protective Relaying Purposes	Joseph Valenzula	Michael Higginson	I29	SASB Approval 15FEB23 Published 24MAY23
C37.233	Guide for Power System Protection Testing	Don Ware	Matt Black	C26	SASB Approval 5JUN23 Published 7SEP23
C37.90.3	Standard Electrostatic Discharge Tests for Protective Relays	Steve Turner	Dan Ransom	I41	SASB Approval 29JUN23 Published 5SEP23
1613	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

Projects under consideration*:*
The PSRC is considering several new projects.

Project	Title		Status
PC37.231	IEEE Standard Common Format for Documenting IED Firmware or Software Changes and confirming their transmittal (COMFIRM)		PAR approved in Main Committee for RP to Standard. PAR expected to be submittal in MyProject. WG I47
PC37.117	Guide for the Application of Protective Relays Used for Abnormal Frequency Load Shedding and Restoration		CTF51 Investigating bringing out of expired status.
PC37.246	Guide for Protection Systems of Transmission to Generation Interconnections		C52 Expect PAR development in Jan 2024
New	Guide for Filter Bank Protection		KTF33 Created May 2023
New	All DC including Entity DC P0050		DTF55 Created SEP 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 – Summary of Updates – M. Zaman

- WG chairs to complete: Understanding IEEE SA's Antitrust, Competition, and Commercial Terms Policies
  - shall be completed by Standards Committee/Working Group Officers within 90 days of appointment as such or by 31 December 2023, whichever is later
- Reminder to email the WG Membership Roster to your PM for Standards Development WGs
  - The membership list should include - Last Name, First Name,, email address and Membership Status (Voting/Non-Member)
- NEW** - Normative Reference Training
  - Standards developers and working group participants receive a concise overview of the most important and broadly applicable facets of incorporating a normative reference clause and a bibliography into an IEEE standard
- Request for IEC standards (New Process)
  - First must utilize the IEC Products & Services Portal (iec.ch) website.
- If the special request is approved by IEC, only a small number of individuals would be granted time-restricted access to the IEC document(s).

Refer to Addendum A of these PSRC Minutes for complete IEEE SA Update

F. IEC Report for September 2023: Eric A. Udren (TC 95 Technical Advisor, USNC)

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

- Chair – Dr. Murty Yalla, US
- 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
- News - Amendment to 27 now in review for technical issues to resolve.
- Revision coming in 2024 - 60255-21-1,2,3 – Mechanical tests – merging into new standard 60255-21.
- These standards impact 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 – cancelled due to 5-year project duration, but restarted by member nation vote.
  - PSRC restarted D34 to review (Fischer).
  - 87L channel issue guide in separate project TS 60255-216-3.
- 60255-187-2 – Functional standard for busbar differential relays – cancelled and restarted but delayed to finish 187-3.
- 60255-132 – Functional standard for directional power relays – new project, CD due in 2023.
- 60255-167 - Functional standard for directional relays – new project, CD in 2023? Directional and directional overcurrent included.

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 with requirements – CD in process.
- 60255-216-3 - Digital Interface - Test specification for protection data communication of Line Current Differential Protection – CD is 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).
- Next team meeting in February 2024 during TC 95 Plenary.

300 Series Functional Standards – New - Functions with IEEE C37.2 or IEC 61850-7-4 Logical Node acronyms – not numbers

- Transient signal-based protection functions
- Traveling Wave (TW) based protection functions
- Voltage Transformer (VT) Fuse Failure Detector
- Current Transformer (CT) circuit Failure Detector
- Loss of mains, anti-islanding protection
- DC network protection functions

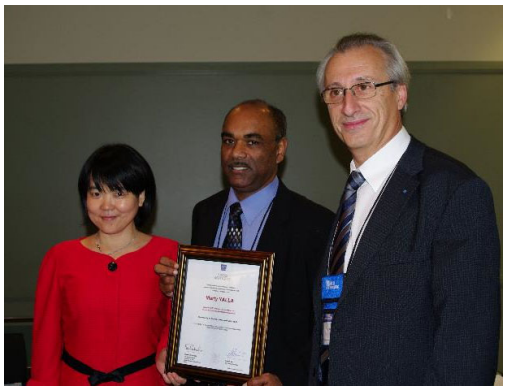
IEC Standards can only have numbers.
Project numbers will be assigned as development projects are commissioned.

Base standard	Acronym	T
IEEE C37.2:2022 - 3.2.1	AFD	Arc Flash Detector
IEEE C37.2:2022 - 3.2.3	DDR	dynamic disturbance recorder
IEEE C37.2:2022 - 3.2.4	DFR	digital fault recorder
IEEE C37.2:2022 - 3.2.7	FLOC	Fault locator
IEEE C37.2:2022 - 3.2.8	HIZ	high impedance fault detector
IEEE C37.2:2022 – 3.2.11	IID	Instantaneous impulse detection
IEEE C37.2:2022 - 3.2.19	RIO	remote input / output device
IEEE C37.2:2022 - 3.2.21	SER	sequence of events recorder
IEEE C37.2:2022 - 3.2.22	TCM	trip circuit monitor
IEC 61850-7-4 : 2020	PHAR	Harmonic Restraint Protection
IEC 61850-7-4 : 2020	PTEF	Transient Earth fault Protection
IEC 61850-7-4 : 2020	PSOF	Switch On To Fault Protection
IEC 61850-7-4 : 2020	PTRC	Protection Trip Conditioning

- 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 Plenary Meeting – Florida, Feb. 19-22, 2024
  - Last meeting was knocked out by hurricane and turned virtual.
  - Maintenance Team (MT) standards development & Friday 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.



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.

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

Sep. 2023 – Myrtle Beach, SC
PSCCC held 22 WG meetings, 3 subcommittee meetings
96 registrants for PSCCC or "Both" (as of Sunday 9/17/2023)
5 newcomers

F0 – Fiber (Chair: Del Khomarlou)

- IEEE Std 1595: IEEE Standard for Testing and Performance for Optical Phase Conductor (OPPC) for Use on Electrical Utility Power Lines
    - *Published April 2023*
- IEEE 1591.1: IEEE Standard for Testing and Performance of Hardware for Optical Ground Wire (OPGW)
    - *Sent for publication*

P0 – Protocols & Architecture (Chair: Tom Dahlin)

- P12TF – Report on Analog Leased Lines Withdrawal of Service
    - *Approved for publication*

S0 – Cybersecurity (Chair: Scott Mix)

- IEEE 1547.3 – Guide for Cybersecurity of Distributed Energy Resources Interconnected with Electric Power Systems
    - *Sent for publication*
- S9TF Report: Utility IT-OT Cybersecurity Challenges in Roles and Terminology
    - *Approved for publication*

Thanks to PSRC officers & committee members for their support of & contributions to PSCCC!

H. NERC Report: Rich Bauer

Update on Standard Developments and Disturbance Reports

- Standards Project 2019-04
- Draft 1 PRC-005-7 - Posted in July
- Existing definition
    - Protection System –
        - Protective relays which respond to electrical quantities,
- Proposed definition
    - Protection System – One or more of the following components:
        - Protective relays and components of control systems which respond to secondary measured electrical quantities and provide protective functions;
- PRC-005-7 proposed maintenance table changes

PRC-005-7 – Protection System, Automatic Reclosing, and Sudden Pressure Relaying Maintenance

Table 1-1 Component Type - Protective relays and Components of control systems which respond to measured electrical quantities and provide protective functions Excluding distributed UFLS and distributed UVLS (see Table 3)		
Component Attributes	**Maximum Maintenance Interval[1]**	**Maintenance Activities**
Any unmonitored protective relay/Component not having all the monitoring attributes of a category below.	6 Calendar Years	For all unmonitored relays/Components: • Verify that protective function settings are as specified For non-microprocessor relays/Components: • Test and, if necessary calibrate For microprocessor relays/Components: • Verify operation of the relay/Component inputs and outputs that are essential to proper functioning of the Protection System. • Verify acceptable measurement of power system input values that are essential to proper functioning of the Protection System.
Monitored microprocessor protective relay/Component with the following: • Internal self-diagnosis and alarming (see Table 2). • Voltage and/or current waveform sampling three or more times per power cycle, and conversion of samples to numeric values for measurement calculations by microprocessor electronics. • Alarming for power supply failure (see Table 2).	12 Calendar Years	Verify: • Protective function settings are as specified. • Operation of the relay/Component inputs and outputs that are essential to proper functioning of the Protection System. • Acceptable measurement of power system input values that are essential to proper functioning of the Protection System.

- Draft 1 PRC-005-7 – Poll Results

	Ballot	Non-binding Poll
	Quorum / Approval	Quorum / Supportive Opinions
PRC-005-7	90.17% / 35.33%	88.13% / 23.37%
Implementation Plan	90.78% / 41.53%	N/A

- Standards Project 2021-04
- Modifications to PRC-002
- 2 SARS
  - Glencoe Light SAR (Phase 1)
  - IBR SAR (Phase 2)
- PRC-002-4 Approved by FERC April 14, 2023
- PRC-002-4 addresses the Glencoe Light SAR only
- Glencoe SAR – clarify connected versus directly connected

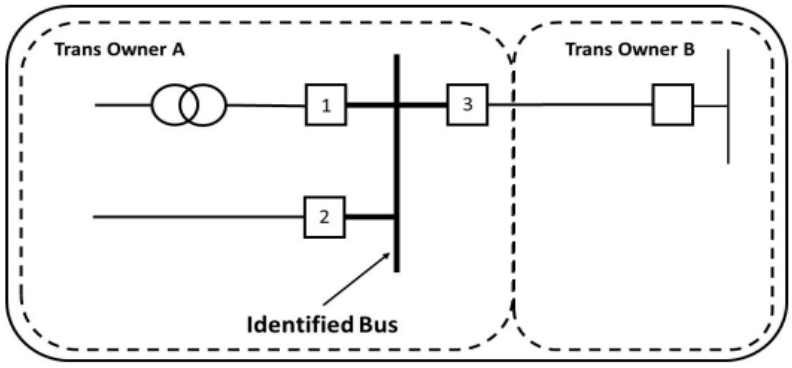


Figure 3

- Phase 2 addresses IBR SAR
- Draft 1 Posted for comment September 2023
- Remove IBR facilities from PRC-002
- Create new IBR Monitoring Standard – PRC-028

PRC-028-1 – Disturbance Monitoring and Reporting Requirements for Inverter-Based Resources

A. Introduction

1. **Title:** Disturbance Monitoring and Reporting Requirements for Inverter-Based Resources
2. **Number:** PRC-028-1
3. **Purpose:** To have adequate data available from inverter-based resources (IBR) to facilitate analysis of Bulk Electric System (BES) Disturbances.
4. **Applicability:**
   - **4.1. Functional Entities:**
     - **4.1.1.** Transmission Owner that owns equipment as identified in section 4.2
     - **4.1.2.** Generator Owner that owns equipment as identified in section 4.2
   - **4.2. Facilities:** The following Elements associated with BES generating plants (inverter-based portion of generating plant/Facility meeting the criteria set by Inclusion I2, Part (b) or Inclusion I4 of the BES definition):
     - **4.2.1** Circuit breaker(s).
     - **4.2.2** Main power transformer(s)[1].
     - **4.2.3** Collector bus.
     - **4.2.4** Shunt static or dynamic reactive device(s).
     - **4.2.5** At least one IBR unit[2] connected to last 10% of each collector feeder length (i.e., furthest from the collector bus).

- Modifications to PRC-002 Phase 2 Ballot Results

	Ballot	Non-binding Poll
Standard	Quorum / Approval	Quorum / Supportive Opinions
PRC-002-5	87.96% / 61.44%	86.09% / 54.45%
PRC-028-1	87.41% / 43.33%	85.44% / 28.07%
Implementation Plan	87.23 / 42.96%	N/A

- Standards Project 2021-01
- PRC-019-3 – Draft 2 posted for comment – June 2023

~~Standard PRC-019-2~~ ~~PRC-019-3~~ — Coordination of Generating Unit or Plant Capabilities, Voltage Regulating Controls, and Protection

1.2. For IBR generating Facilities, assuming the voltage control mode is enabled in the power plant controller and/or IBR unit(s)[6] and steady-state system operating conditions, verify the following coordination items:

1.2.1. The in-service control functions of the power plant controller are set to operate before the protective functions of the applicable Facilities in order to avoid disconnecting any of the Facilities listed under Section 4.2.4 unnecessarily.

1.2.2. The in-service control functions of IBR unit(s) are set to operate before protective functions of the applicable Facilities in order to avoid disconnecting any of Facilities listed under Section 4.2.4 unnecessarily.

1.2.3. The applicable in-service protective functions are set to operate to isolate or de-energize equipment in order to limit the extent of damage when operating conditions exceed equipment capabilities.

M1. Each Generator Owner and Transmission Owner with applicable Facilities will have evidence such as a graphical representation(s) of coordination including a P-Q Diagram, R-X Diagram, Inverse Time Diagram, equivalent tables, steady-state calculations, dynamic simulation studies, or other evidence that it performed a coordination study as specified in Requirement R1. This evidence should include dated documentation that demonstrates the coordination was performed.

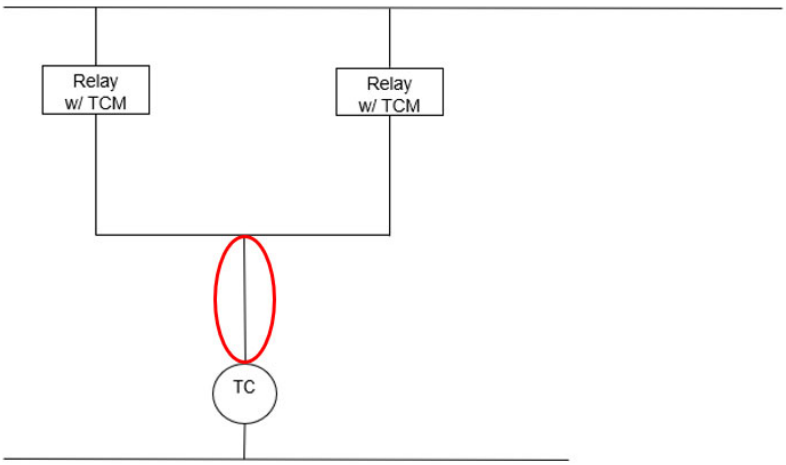
- Draft 2 PRC-019-3 – Poll Results

	Ballot	Implementation Plan	Non-binding Poll
	Quorum / Approval	Quorum / Approval	Quorum / Supportive Opinions
MOD-025-3	87.04% / 36.05%	86.62% / 46.46%	85.88% / 34.88%
PRC-019-3	86.99% / 46.73%	86.67% / 54.39%	85.94% / 44.07%

- Standard Project 2022-02
- TPL-001-5 Footnote 13
- Single Point of Failure

Category	Initial Condition	Event [1]	Fault Type [2]	BES Level [3]	Interruption of Firm Transmission Service Allowed [4]	Non-Consequential Load Loss Allowed
P5 Multiple Contingency *(Fault plus non-redundant component of a Protection System failure to operate)*	Normal System	Delayed Fault Clearing due to the failure of a non-redundant component of a Protection System[13] protecting the Faulted element to operate as designed, for one of the following: 1. Generator 2. Transmission Circuit 3. Transformer[5] 4. Shunt Device[6] 5. Bus Section	SLG	EHV	No[9]	No
				HV	Yes	Yes

- Footnote 13
  - 13. For purposes of this standard, non-redundant components of a Protection System to consider are as follows:
  - d. A single control circuitry (including auxiliary relays and lockout relays) associated with protective functions, from the dc supply through and including the trip coil(s) of the circuit breakers or other interrupting devices, required for Normal Clearing (the trip coil may be excluded if it is both monitored and reported at a Control Center).



- PRC-023-6
- Filed with FERC March 2
- Remove R2
- Remove Attachment - 2.3

PRC-023-6 – Transmission Relay Loadability

Requirement R1, criterion 12 in the Facility Rating determination for the circuit.

13. Where other situations present practical limitations on circuit capability, set the phase protection relays so they do not operate at or below 115% of such limitations.

M1. Each Transmission Owner, Generator Owner, and Distribution Provider shall have evidence such as spreadsheets or summaries of calculations to show that each of its transmission relays is set according to one of the criteria in Requirement R1, criterion 1 through 13 and shall have evidence such as coordination curves or summaries of calculations that show that relays set per criterion 10 do not expose the transformer to fault levels and durations beyond those indicated in the standard. (R1)

R2. ~~Each Transmission Owner, Generator Owner, and Distribution Provider shall set its out-of-step blocking elements to allow tripping of phase protective relays for faults that occur during the loading conditions used to verify transmission line relay loadability per Requirement R1. *[Violation Risk Factor: High] [Time Horizon: Long-Term Planning]*~~ Reserved.

M2. ~~Each Transmission Owner, Generator Owner, and Distribution Provider shall have evidence such as spreadsheets or summaries of calculations to show that each of its out-of-step blocking elements is set to allow tripping of phase protective relays for faults that occur during the loading conditions used to verify transmission line relay loadability per Requirement R1. (R2)~~ Reserved.

~~PRC-023-5~~ Attachment A

1. This standard includes any protective functions which could trip with or without time delay, on load current, including but not limited to:

1.1. Phase distance.

1.2. Out-of-step tripping.

1.3. Switch-on-to-fault.

1.4. Overcurrent relays.

1.5. Communications aided protection schemes including but not limited to:

1.5.1 Permissive overreach transfer trip (POTT).

1.5.2 Permissive under-reach transfer trip (PUTT).

1.5.3 Directional comparison blocking (DCB).

1.5.4 Directional comparison unblocking (DCUB).

1.6. Phase overcurrent supervisory elements (i.e., phase fault detectors) associated with current- based, communication-assisted schemes (i.e., pilot wire, phase comparison, and line current differential) where the scheme is capable of tripping for loss of communications.

2. The following protection systems are excluded from requirements of this standard:

2.1. Relay elements that are only enabled when other relays or associated systems fail. For example:

- Overcurrent elements that are only enabled during loss of potential conditions.
- Elements that are only enabled during a loss of communications except as noted in section 1.6.

2.2. Protection systems intended for the detection of ground fault conditions.

2.3. Reserved. ~~Protection systems intended for protection during stable power swings.~~

2.4. Reserved. ~~Not used.~~

2.5. Relay elements used only for Remedial Action Schemes applied and approved in accordance with NERC Reliability Standards PRC-012 through PRC-017 or their successors.

- Project 2023-02 Performance of IBRs - PRC-004
  - Clarify requirements for IBR analysis (interrupting device)

- Project 2020-02 Modifications to PRC-024
  - Make it a ride through Standard rather than a relay setting Standard

- Hot Off The Press – Posted Monday
- Project 2020-06 Verifications of Models and Data for Generators

MOD-026-2 – Verification of Dynamic Models and Data for BES Connected Facilities

New or Modified Term(s) Used in NERC Reliability Standards

Background:
This section includes all new or modified terms used in the proposed standard that will be included in the *Glossary of Terms Used in NERC Reliability Standards* upon applicable regulatory approval. The terms proposed below are intended to be used in MOD-026-2 and other inverter-based resource related standards.

Term(s):
Power Electronic Device (PED): Any device connected to the ac power system through a power electronic interface that generates or transmits active power or reactive power, or absorbs active power for the purposes of re-injecting it at a later time. This term excludes any load.

Inverter-Based Resource (IBR): Any source of electric power consisting of one or more Power Electronic Devices (PEDs), that operates as a single resource, supplies primarily active power, and connects to the Bulk Power System. An IBR plant/facility includes the Power Electronic Devices, and the equipment designed primarily for delivering the power to a common point of connection (e.g. step-up transformers, collector system(s), main power transformer(s), and power plant controller(s)).

Disturbance Reports:

- Panhandle Wind Disturbance / Texas Event: March 22, 2022 / Joint NERC and Texas RE Staff Report – August 2022
- 2022 Odessa Disturbance / Texas Event: June 4, 2022 / Joint NERC and Texas RE Staff Report – December 2022
- 2023 Southwest Utah Disturbance / Southwestern Utah: April 10, 2023 / Joint NERC and WECC Staff Report – August 2023
- Coming soon: 2022 CA BESS Disturbances / California Events: March 9 and April 6, 2022 / Joint NERC and WECC Staff Report – August 2023

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

RSICC Update - PSRC Progress Update Sep 20, 2023
RSICC Annual Meeting – GM 2022
RSICC Committee Meeting

- July 20, 9.00 AM – 12.00 PM EST During IEEE PES GM Meeting

The role of RSICC is to serve as a focal point within the Power and Energy Society (PES) for the identification of challenges associated with the integration of renewable energy resources, related energy carriers (storage, fuels, heat) and related electrification applications (transportation, buildings, industry.)

- RSICC is leading the drafting of PES road map chapter one – renewable integration
- Each subcommittee (10) provided 10 minutes update of activities related to Renewable energy.

Time	Agenda Item	Duration
9:00-9:20AM	Introduction to RSICC, RSICC objectives, welcome note by RSICC chair, meeting notes from last meeting	20mins
9:20-9:40AM	Brief intro round the table	20mins
9:40-9:50AM	Presentation by Ed teNyenhuis (Transformer sub-committee)	10mins
9:50-10:00AM	Presentation by Junbo Zhao (SBLCS)	10mins
10:00-10:10AM	*Online* Presentation by Kamal Garg (PSRC)	10mins
10:10-10:20AM	Presentation by Curtis Ashton (ESSB)	10mins
10:20-10:30AM	Presentation by Ahda Pavani (PSDP)	10mins
10:30-10:40AM	Presentation by Doug Edwards (Switchgear)	10mins
10:40-10:50AM	Presentation by Xin Fang (PSOPE)	10mins
10:50-11:00AM	Break	10mins
11:00-11:10AM	Presentation by Kwok Cheung (AMPS)	10mins
11:10-11:20AM	Presentation by Liangmin Yao (RSICC-China Satellite Committee)	10mins
11:20-11:30AM	Presentation by Eriks Surmanis (T&D)	10mins
11:30-11:40AM	Update on PES Roadmap – Chapter 1 – Renewable Integration by YC Zhang (Chair, RSICC) and collaboration with CIGRE	10mins
11:40-11:50AM	Update on collaboration with CIGRE by YC Zhang	10mins
11:50-12:00PM	Discussion of agenda for the year; Closing comments	10mins

- **IEEE PSRC**
  - WG and reports related to IBR protection issues
  - **PSOPE- Renewable Integration Activities in Power System Operation, Planning and Economics Committee (PSOPE)**
  - 3 Tutorials related to Modeling and distribution system
  - Additional material of interest listed in slides
  - **ESSB- Energy Storage and Station Battery**
  - Discussed standard project related to RSICC
- **Power System Dynamic Performance Committee** – Dynamic models for RES, Design and analysis of controllers, Simulation software, VAR management etc.
  - Panel session 2023 – Modeling of Inverter-Based resources for large stability studies and Grid Forming Inter Technology
  - Panel session 2024 – Generic models for transient stability and Restoration of IBR-dominated Power Systems
  - **AMPS- Analytic Methods for Power Systems** – Investigate modeling, analysis, solutions etc.
  - 20 panel sessions in 2022 PESGM

J. Other Reports of Interest
In Memoriam - Zitao "Peter" Wang
Passed away July 13, 2023

- PSRC participant for 5 years
- Member of I SC for 1 year
- Liaison to new WG
  Guide for Test Sets and Tools for Testing Protective Relays

- S&C Electric Company for 12 years
- PhD expert in Power Electronics
- 4 US Patents
- Avid Marathoner
  Boston 3:31:16
  Chicago 3:22:55

In Memoriam - Michael (Mischa) Steurer

Passed unexpectedly in August, 2023

- Chair of WG creating IEEE 2004, Hardware-in-the-Loop (HIL) Simulation Based Testing of Electric Power Apparatus and Controls
  - PSRC is a joint sponsor
  - In SA ballot stage
- Researcher at Florida State University in the Center for Advanced Power Systems
- Institute for Electrical and Electronic Engineers (IEEE) - Senior Member
- International Council on Large Electric Systems (CIGRE) - Member
- American Society of naval Engineers (ASNE) – Member
- Accomplished bluegrass musician

IV. Advisory Committee Reports: - Michael Thompson

B1: Awards and Technical Paper Recognition Working Group

Chair: Andre Uribe
Vice Chair: Mal Swanson
Secretary: Miguel Rios
Assignment: Nominate PSRC sponsored papers, standards, and reports for PES Technical Council and IEEE awards. Nominate individual members and WG's for award recognition.

WG Members:

- Manish Patel
- Alla Deronja
- Hugo Monterrubio
- Angelo Tempone
- Will English
- Brandon Davies
- Don Lukach
- Brian Mugalian

Our September PSRC Awards Ceremony took place this last Monday (9/18/2023) during our welcome reception

- Awards announced & presented included:
  - Individual Awards
    - Bronze Service Awards
    - Silver Service Awards
    - Platinum Service Awards
  - Outstanding Standards Awards
    - WG J19 - IEEE C37.106 - 2022

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 – TRIVA QUIZ:
Who initiates the IEEE Standards Association Working Group Awards to request certificates of appreciation once it has been completed and the standard has been approved?
THE WORKING GROUP CHAIR OR VICE CHAIR
Where do you initiate the request?
THROUGH THE IEEE SA AWARDS WEBSITE:
http://standards.ieee.org/develop/awards/wgchair/wgawards.html

How do you initiate the request?
Provide Your Working Group information
Include: Your Name | You Contact Number | Your Email Address
Award Date - Allow six weeks for processing

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

Met Monday, September 18th, 2023 – 3:40 – 4:50 PM PST
In-Person: Myrtle Beach, SC, Room: Atlantic B
Assignment: Nominate PSRC sponsored papers, standards, and reports for PES Technical Council and IEEE awards. Nominate individual members and WG's for award recognition.
Meeting Minutes

1. Introductions were held
2. Held meeting with 7 members
3. Discussion and Approval of May 2023 Meeting Minutes
4. Voted on candidates for the Paper Prize Awards
5. Voting on candidates for Young professional awards
6. Adjournment

B2: Fellows Award Working Group
Chair: T.W. Cease
No report.

B3: Membership Working Group
Membership Activity Report - September 18, 2023
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 September 18 meeting was 257, which is a good recovery from hybrid meeting during the past 2 years..

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

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

B4: Long Range Planning Working Group
Chair: Murty Yalla
No report

B5: Publicity Working Group
Chair: Cathy Dalton
Vice Chair: 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 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 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 agendas are difficult to obtain.

B8: O&P Manual Revision and Working Group Chair Training Working Group
Chair: Don Lukach
O&P has been revised. A revision was sent on 8/14/23 to the PSRC Main Committee Voting Members and informational meeting was held on 8/31/23 to discuss comments received on that revision. Based on the discussions, a final revision was sent to the PSRC Voting Members on 9/12/23 for review and acceptance at the September PSRC meeting in Myrtle Beach, SC.
Don Lukach made a motion at the September 21 PSRC Main Committee meeting to accept the 9/12/23 revision. Motion was seconded by Steve Conrad. The motion passed unanimously.
The 9/12/23 revision (pending formatting edits) will be submitted for approval by PES Technical Council as required by PES rules.
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: September 20 2023
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
Mike Jensen	PG&E	Participant
Jens Boemer	EPRI & NREL/DOE	Voting Member
Mamadou Diong	Dominion Energy	Participant
Rob Mossel	Siemens Energy	Participant
Sean Carr	ComEd	Voting Member

Mondal Abrez	EPRI	Participant
Dr. Mike Ropp (Virtual)	Sandia National Lab	Participant
Charlie Sufana	Retired	Voting Member
Mike Thompson	SEL Engineering Serv.	Participant
		Participant
		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: January 2024, New Orleans, LA
MMR: Request that B11 show "open to all" on the agenda to encourage more participation by industry. It was assumed by PSRC attendees that B11 was by invitation only.

Topics discussed:

- SC21 Electric Energy Resources Interconnection Standards Collaborative
- Not formally entity basis but individual stakeholder perspective
- https://standards.ieee.org/industry-connections/activities/electric-energy-resources-interconnection-standards-collaborative-isc/
- Mike Thompson: on "trip" new definition, what is NERC thinking and distribution and transmission and specifically the NERC system protection group?
- Jens: 2800 does not have a trip definition. Not sure if there is an opinion on NERC definition.
- Mike Jensen: Is also not 100% sure on the NERC definition. Believes this conversation is contentious.
- Charlie S: Believes "exit service" is not going to sit well with PSRC.
- Mat: Trip should mean protective trip function and open is a control function.
- This was further discussed and a call to action for involvement from PSRC to flush this out more.
- Jens has requested an official PSRC definition of trip. Mike Thompson says the IEEE online dictionary (not IEEE 100 any longer) is the authoritative source. Mal is the PSRC terminology leader we can connect him to Jens and Mamdou for interface.
- Potential for formation of 1547 Protection Task Force:
- Call to action for PSRC to have statement of purpose and need
    - Scope of Task Force
    - Lead for Task Force
- We are also encouraging more PSRC participation in the individual subgroups
- 1547.10 Update: There is now a working draft definition for what at DER gateway is (see slide).
- Slide has the list serve for participation in the 154710 subgroups
- Mike Ropp mentioned:
  Just an FYI for the group: we are having some preliminary conversations about updating IEEE 1547.6, which is on DERs in secondary networks. I bring that up here

because this standard is pretty much all about the impacts of DERs on the protection of secondary networks. There is not yet a PAR for a 1547.6 revision.

Action Items:
- Send Links and presentation to B11 WG.

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 B to these MC Minutes. Subcommittee reports are presented alphabetically by Subcommittee for ease of reference; actual sequence of reporting at the MC meeting was C, D, H, I, J, K.)

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 September 20, 2023, and attained quorum; attendance figures will be in the C SC Minutes
No new members at this meeting
Fred Friend asked to be made a guest. Thank you for your contributions to C SC, Fred!

Standards Projects Status Updates

C26: C37.233 Guide for Power System Protection Testing
Standard published, working group disbanded

C33: P2004 Recommended Practice for HIL Simulation Testing Power Apparatus & Control
Standard is in IEEE SA balloting. WG chair unexpectedly passed away.

C38: P2030.12 Guide for Design of Microgrid Protection Systems
Resolving ballot comments, expecting to recirculate before next meeting

C39: C37.252 Guide for Testing Automatic Voltage Control Systems in Regional Power Grids
Resolving SC review comments before SA ballot
SC approved two-year PAR extension

CTF51: C37.117 Guide for the Application of Protective Relays Used for Abnormal Frequency Load Shedding and Restoration
Task Force investigating interest in revising

C52: C37.246 Guide for Protection Systems of Transmission-to-Generation Interconnections
Working group created on Wednesday after Task Force confirmed interest in revising standard
Revising existing standard

Disbanded:

C25: Summary of Protection of Wind Electric Plants
C26: C37.233 Power System Protection Testing

Elevated Task Force to Working Group:
C53- Artificial Intelligence / Machine Learning (AI/ML) Data Collection Working Group **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. **Chair:** Dan Sabin; **Vice Chair/Secretary**: TBD

"D" Subcommittee Report – Line Protection
Chair: Meyer Kao
Vice Chair: Alla Deronja
Refer to D SC Minutes for complete report.
Met on September 20, 2023; met quorum – 28 members present out of 44
14 Active Working Groups 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

D30: Tutorial on Application and Setting of Ground Distance Elements on Transmission Lines
- Chair: Karl Zimmerman, Vice-Chair: T. Warren
- Balloting has met the subcommittee 3/4 approval criteria
- **D30** is working resolving comments from the D-Subcommittee balloting.

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

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
- Quorum was not met at this meeting, so can't vote to disband the WG.

New Working Group:
D53 WG: Report on distribution line protection practices survey
- Chair: M. Hamid
- Vice Chair: G. Ryan
- Secretary: B. Boysen

New Task Force:
DTF54 TF: Evaluate creation of a report on protection of distribution lines with resonant or compensated neutral sources

- Chair: Russ Patterson

New Task Force:

DTF55 TF: Protection of HVDC systems and DC distribution systems

- Chair: Brandon Lewey

"H" Subcommittee Report – Relaying Communications and Control

Chair: Aaron Martin
Vice Chair: Hugo Monterrubio
Refer to H SC Minutes for complete report.
H SC met September 20, 2023, with 33 Members and a number of guests. Quorum was established.
H SC currently has 18 active Working Groups (WGs) and one Taskforce: 9 WG are working on IEEE Standards and 7 WG are generating PES Technical Reports.

WG H17 Completed Technical Report Establishing Links between COMTRADE, IEC 61850, and CIM Chair: C: Brunner in 2021. Comments were received in Spring of 2021. WG H17 has completed addressing all comments. Original commenters will be asked to review latest draft of report.

Subcommittee H - PAR Extensions Requests

WG H22 PC37.249 Guide for Categorizing Security Needs for Protection Related Data Files is in comment resolution in SA and submitted a request to HSC for approval submit 1 year PAR extension. HSC Chair: A, Makki
WG H27 PC37.251: Standard for Common Protection and Control Settings or Configuration Data Format (COMSET), did submit a request for a 1 year PAR extension upon electronic approval by the HSC this last summer. Chair: M. Capuozzo
WG H41 P1646:, Revision of 1646 Communication Delivery Time Performance Requirements did submit a request for a 2 year PAR extension upon electronic approval by the HSC this last summer. Chair: D. Dolezilek
WG H46 PC37.1.3:, Recommended Practice for Human-Machine Interfaces (HMI) used in Substation Automation Systems did submit a request for a 2 year PAR extension upon electronic approval by the HSC this last summer. Chair: M. Black

Subcommittee H — Request to form sponsor ballot

WG H40 PC37.1.2 : Recommended Practice for Databases Used in Utility Automation Systems motion to IEEE-SA for Sponsor ballot was approved by HSC. Chair: T. Laughner
WG H46 PC37.13 : Recommended Practice for Human Machine Interfaces (HMIs) used with Electric Utility Automation Systems to IEEE-SA for Sponsor ballot was approved by HSC. Chair: M. Black
WG H51 PC37.239 : Standard IEEE P37.239 Standard for Common Format for Event Data Exchange (COMFEDE) motion to IEEE-SA for Sponsor ballot was approved by HSC. Chair: M. Adamiak

"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, September 20, 2023, with 22 members present — quorum was established. Complete attendance will be in the minutes.
Total 37 Voting Members
Approved I SC Minutes from May 2023

Presently 19 Active WG/TF (2 disbanded and 2 new)

WG updates of note:

I32 – *Survey relay test practices*

- Received 112 survey responses! Thanks to everyone who responded!
- Using the 81 qualified responses of the total 112, WG has started drafting report.

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

- 1613 approved for publication by RevCom!
- C37.90 working through definitions with WG I2 and soon to seek permission to go to SA Ballot.
- C37.90.1 WG ballot complete and SC approved to initiate IEEE-SA Ballot.
- C37.90.2 resolved ballot comments and is initiating recirculation, expecting RevCom approval soon. Submitting 1-year PAR extension request to avoid risk.

I41 published C37.90.3-2023: *IEEE Standard for Electrostatic Discharge Tests for Protective Relays*

I29 published C37.110-2023: *IEEE Guide for the Application of Current Transformers for Protective Relaying Purposes*

- **I29** disbanded.
- **ITF51** to determine need and interest of summary paper

I38 – C37.92-2023 – *Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources*

- Disbanded following publication
- **I50** – Summary Paper. Eric Udren is chair.

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 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.

I2 – *Terminology Review*

- Benton is liaison with PSCCC. Task force A8 has formed and is training with WG I2.

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

- WG and SC Ballot completed. Waiting for Officers Review and Approval.

I33 – *Report on Review of Relay Testing Terms*

- SC ballot was completed with 31 out of 39 I-SC members responding. Working group resolving comments.

I48 – *Review and revise C37.103-2015 – IEEE Guide for Differential and Polarizing Relay Circuit Testing.*

- Met with 1 member and 1 guest, would benefit from additional participation. Draft is being developed, work progressing well via virtual meetings.

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

- Report is at final draft stage having resolved all comments received from WG members. Chair is formally documenting 75% approval from WG, then proceed shortly with SC Ballot.

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 end of this year.

I43 – *Report on Response to USA executive order regarding EMP protection*

- Soliciting industry expertise

- 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.

I47 – *Review and revise: IEEE C37.231-2006 - IEEE Recommended Practice for Microprocessor-Based Protection Equipment Firmware Control.*

- Approved May 2023 at Main Committee meeting for elevation to Standard
- Working on PAR Submittal.
- PSRC continues as Lead Committee and PSCCC plans to be Joint Committee.

OTHER TOPICS

Looking for Liaison for:

- Sensors SC of the Power System Instrumentation and Measurements (PSIM) Committee
- Transformers Committee—Will Knapek is retiring end of this year
- P0079 – Entity WG for *Guide for Test Sets and Tools for Testing Protective Relays*

"J" Subcommittee Report – Rotating Machinery

Chair: Gary Kobet
Vice Chair: Will English
Refer to J SC Minutes for complete report.
J SC met Wednesday, September 20, 2023, with 17 members present – quorum was met

- **J6/JTF28** Protection Issues Related to Pumped Storage Hydro Units –SC ballot complete, resolving comments
- **J15** Investigation of the Criteria for Motor Bus Transfer – Resolving WG ballot comments
- **J20** Practices for Generator Synchronizing Systems – will be in SC ballot October 2023
- **J25** Synchronous condenser protection (report) –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: 1st recirculation ballot open now through 9/29/2023 (draft 7.6), expect 2nd recirculation ballot soon
- **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 Wed September 20, 2023, with 53 attendees. Quorum Met – 16 of 29 members present

- **K25** PAR Extension Approved by SC
- Sabastian Billaut provided a presentation "Slingshot Disconnection! Understanding the effect of disconnecting an un-stabilized ungrounded source" related to ongoing work on **KTF33**.

Established WG's continuing work: (6 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

New working group **K34** formed with assignment:

- Develop a Summary Paper for the revision of C37.109 IEEE Guide for the protection of Shunt Reactors.
    - Chair: Kamal Garg

MOTION: PSRC accept Joint Committee work of PC57.135 in the role of Liaison.
Motion made by Brandon Davies; **Seconded by** Pratap Mysore.

- **Title:** Joint Committee Work for PC57.135 Guide for the Application, Specification, and Testing of Phase-Shifting Transformers
- **Lead Committee:** Transformers (PE/TR)
- **PSRC Role:** Non-Lead, Liaison
- **PSRC SC/ Group:** SC K, Liaison
- **K SC Motion** made by: Michael Thompson, Second: Lubo Sevov**;** Unanimous approval by subcommittee

Motion Passed Unanimously.

VI. Presentation to the Main Committee:

Eric Udren made a presentation on Simplified Relay Input Interfacing and Testing based on newly published IEEE Standard C37.92™-2023 *IEEE Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources*

VII. Old Business:

No Old Business

VIII. New Business:

No New Business

IX. Announcements:

Next meeting will be Hybrid format at the Sheraton New Orleans, New Orleans, Louisiana, in January 2024 at the IEEE/PES Joint Technical Committee Meetings (JTCM)

X. Adjourn:

Motion to Adjourn by Ritwik Chowdhury; second by Deepak Maragal.
Meeting adjourned 10:45 AM EDT.

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

Addenda:
Addendum A: IEEE Standards Association – Policy and Training Updates
Addendum B: Minutes from Subcommittee and Working Group Meetings: SC C, D, H, I, J, K
Addendum C: PSRC Sept 2023 Meeting Agenda, Draft 6 (Final)

Addendum A: IEEE Standards Association – Policy and Training Updates Fall 2023 PSRC/PSCCC meeting, Myrtle Beach, SC

IEEE SA
STANDARDS ASSOCIATION

PES PSCCC/PSRC FALL MEETING

MYRTLE BEACH, SC
SEPT 2023
IEEE SA

IEEE

IEEE SA – SUMMARY OF UPDATES – M. ZAMAN

- ***WG chairs to complete:*** **Understanding IEEE SA's Antitrust, Competition, and Commercial Terms Policies**
  - shall be completed by Standards Committee/Working Group Officers within 90 days of appointment as such or by 31 December 2023, whichever is later
- **Reminder to email the WG Membership Roster to your PM for Standards Development WGs**
  - The membership list should include - Last Name, First Name,, email address and Membership Status (Voting/Non-Member)
- **NEW** - Normative Reference Training**
  - Standards developers and working group participants receive a concise overview of the most important and broadly applicable facets of incorporating a normative reference clause and a bibliography into an IEEE standard
- **Request for IEC standards (New Process)**
  - First must utilize the IEC Products & Services Portal (iec.ch) website.
  - If the special request is approved by IEC, only a small number of individuals would be granted time-restricted access to the IEC document(s).

IEEE SA POLICY UPDATES – MANDATORY TRAINING

The SASB resolved that the **Understanding IEEE SA's Antitrust, Competition, and Commercial Terms Policies training** shall be completed by Standards Committee/Working Group Officers within 90 days of appointment as such or **by 31 December 2023, whichever is later.**

1. **Understanding IEEE SA's Antitrust, Competition, and Commercial Terms Policies**

*Completion of **Working Group Chair Fundamentals** is now **optional**.*

2. Working Group Chair Fundamentals (WGCF)

These courses are also made available to all volunteers who participate in IEEE SA standards development.

Training is available through the IEEE Learning Network (ILN).

Alias regarding questions on the training satrainingdevelopment@ieee.org
How to obtain Certificate for Training Completion

UPDATES TO MANDATORY TRAINING -FAQS

- How do I enroll in an IEEE SA required course?
- What username and password do I use to log into ILN?
- Who is required to take IEEE Standards Association (IEEE SA) Training?
- How will I know if I'm required to take compliance courses?
- How does training required as part of my role with IEEE Standards Association (IEEE SA) differ from IEEE Compliance Training?
- Can I receive Professional Development Hours (PDHs) for these trainings?
- How much of a time commitment are these courses?
- Do I need to complete the entire course in one sitting?
- How many times can I retake an end of module Knowledge Check?
- Where can I learn more about ILN?
- Can I access other courses that I have purchased on the ILN on the same site where my IEEE SA required courses are located?
- Why do the courses I am required to complete by IEEE SA not show up on the IEEE Compliance Training dashboard?
- Who do I contact for technical assistance with IEEE SA Required Volunteer Training?
- Who do I contact with concerns regarding the content of IEEE SA Required Volunteer Training?
- Who do I contact with questions regarding the policies and procedures of IEEE SA Required Volunteer Training?

MANDATORY TRAINING – SUGGESTED ACTIONS

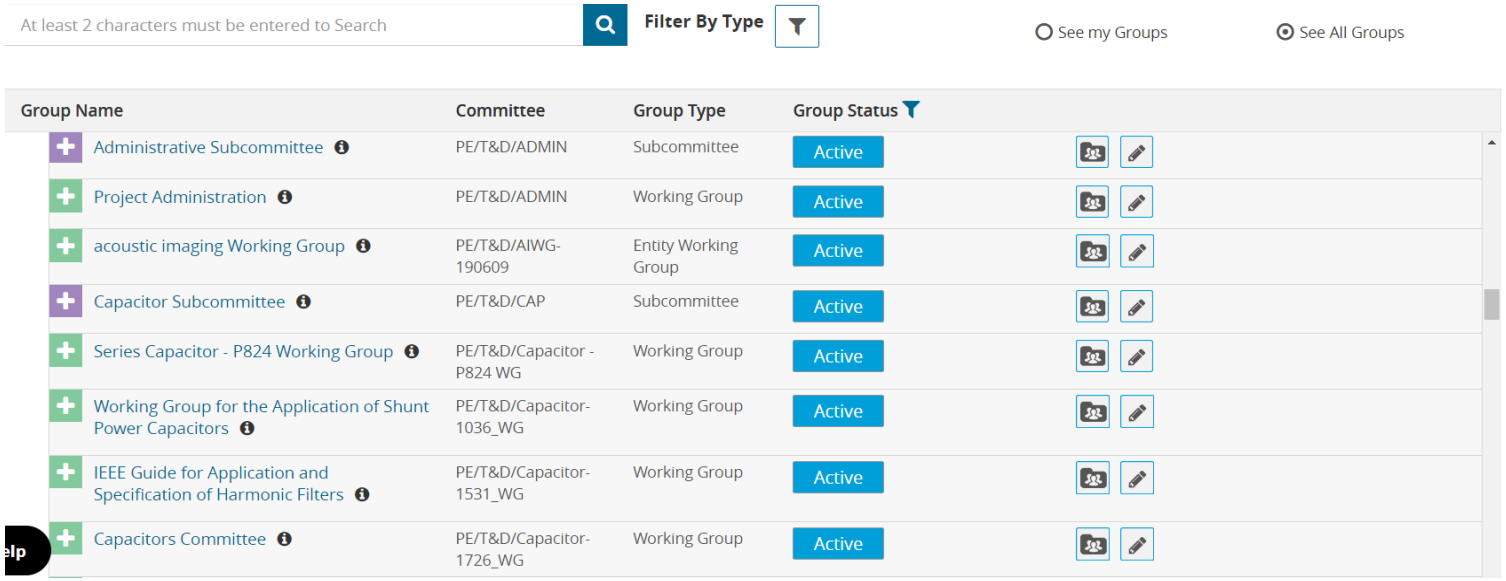
- To make sure that the SC's update the WG officer information in myProject as that is the trigger for the tracking and notification
  - Committee(s) that have subcommittees, consider adding Subcommittee levels to add Subcommittee Officer information from the Manage groups area in myProject
- We request that the SC officer help support the message and awareness of this mandatory requirement
- If needed IEEE SA can manually verify if the officers have completed the course, please contact your PM.

MYPROJECT – MANAGE GROUPS AREA

For the benefit of tracking; Membership, Officer Roles, Officer Training compliance and WG awards submission process;

- **IEEE SA is strongly encouraging the Standards Committee and its WGs to utilize the IEEE SA myProject Manage Groups area**
  - myProject Roster area to record Membership involvement
  - For PES committee to add Subcommittee information
    Helps Track the officer roles for compliance of the Officer Training
  - Convenient for WG chair during the submission of the WG awards process when project is approved by SASB.

MYPROJECT – MANAGE ROSTER/SUBCOMMITTEE



Group Name	Committee	Group Type	Group Status
Administrative Subcommittee	PE/T&D/ADMIN	Subcommittee	Active
Project Administration	PE/T&D/ADMIN	Working Group	Active
acoustic imaging Working Group	PE/T&D/AIWG-190609	Entity Working Group	Active
Capacitor Subcommittee	PE/T&D/CAP	Subcommittee	Active
Series Capacitor - P824 Working Group	PE/T&D/Capacitor - P824 WG	Working Group	Active
Working Group for the Application of Shunt Power Capacitors	PE/T&D/Capacitor-1036_WG	Working Group	Active
IEEE Guide for Application and Specification of Harmonic Filters	PE/T&D/Capacitor-1531_WG	Working Group	Active
Capacitors Committee	PE/T&D/Capacitor-1726_WG	Working Group	Active

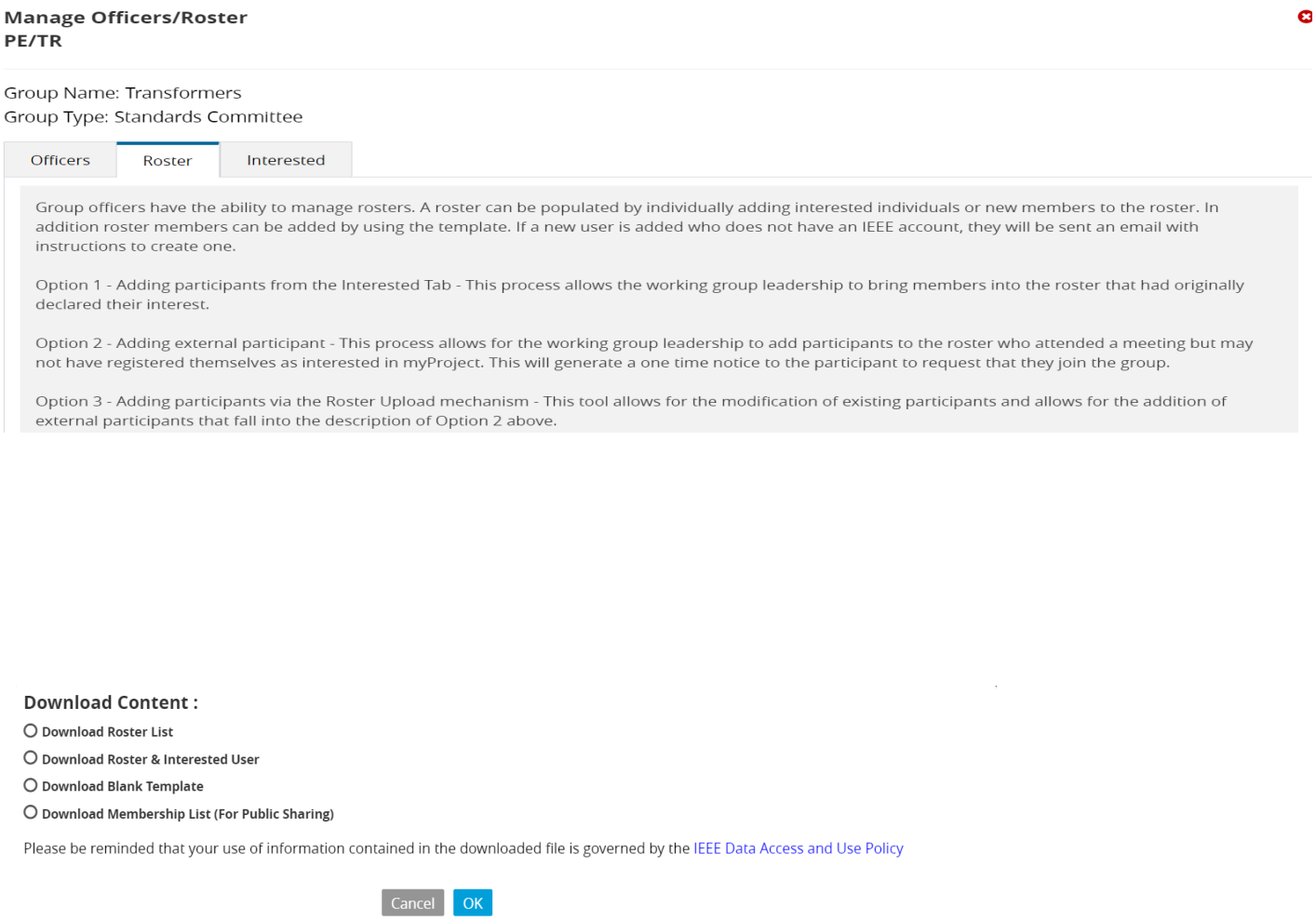
MYPROJECT – WG ROSTER

- **With the transition of the WG awards process into the myProject system**
  - Benefit to the WG members to be added to the myProject roster in order to populate the WG members information
  - Essential that WG with active PARS take action now rather than after the WG is no longer active
  - Currently in order to populate the WG awards list WG chairs need to populate the WG roster first for the WG members names to appear
  - IEEE SA is strongly encouraging the Standards Committee and its WGs to utilize the IEEE SA myProject Rostering tool

  - Steps to Upload WG roster in myProject
  - Upload/Download Roster

ROSTER VIEW

Here is a View of the **Manage Groups** area, Note the **Roster Tab**



MYPROJECT - WG AWARDS

- Working Group Awards Once there is Final approval of a project by the IEEE SASB, it is an important opportunity to recognize standards development participants with working group awards (plaques and certificates)
  - *This myProject feature will allow a Working Group Chair or Vice-Chair to populate a list of award recipients based on involvement levels set in the Working Group roster.*
  - *The system will automatically pull the recipient's address from their IEEE account profile if they have provided one.*
    NOTE: Roster needs to be up to date in order to populate the awards list
  - *Select the type of award the individual should receive and select a delivery method.*
  - *Once all selections are made, the information can be submitted to the IEEE SA Awards Administrator for processing.*

Steps for WG awards process

ADDITIONAL RESOURCES – IEEE SA EDITORIAL HUB

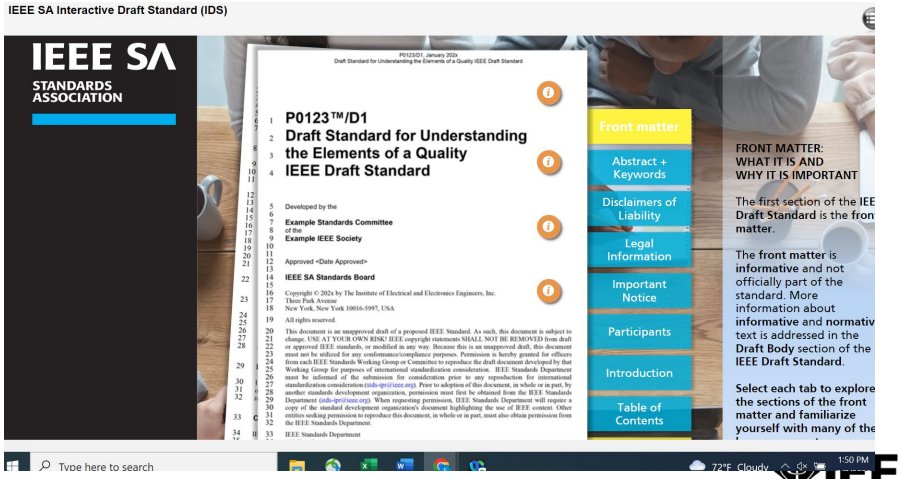
The IEEE SA Content Production and Management Team has developed an Interactive resource to assist with draft development and editorial process.

- **NEW** - Normative Reference Training**
  - Standards developers and working group participants receive a concise overview of the most important and broadly applicable facets of incorporating a normative reference clause and a bibliography into an IEEE standard.

- **The IEEE SA Interactive Draft Standard**
  - Drawing on the IEEE SA Standards Style Manual and the IEEE SA MS Word® Standards template, this tool walks you through a sample draft, explaining how to approach each section

Access to IEEE SA Editorial Guidance Hub

Use your IEEE Member sign in



REQUEST FOR IEC STANDARDS (NEW PROCESS)

- IEEE SA Working Groups (WGs) that wish to obtain IEC documents first must utilize the IEC Products & Services Portal (iec.ch) website.
  - A lot of information is already available for all IEC deliverables (concerned IEC TC, scope, table of content, introduction, preview of the document, normative references).
  - This website is public, and WGs should first review the website for information on the document(s) they want to review.
  - If additional information or a more detailed review is needed, then the WG will need to contact their IEEE SA PM to submit a special request with the rationale for why the document(s) is/ are needed.
    - If the special request is approved by IEC, only a small number of individuals would be granted time-restricted access to the IEC document(s).
    - The WG Chair should select two individuals to review the document(s)
  - Category A and C liaisons relationships follow a different process and this ‘’new process’” does not apply, nothing has changed with the liaisons.

QUESTIONS?

CONTACT US!

Malia Zaman - PSRC

Senior Program Manager

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(732) 850 6608

Tom Thompson - PSCCC

Program Manager
thomas.thompson@ieee.org
(732) 562 5564

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

System Protection "C" Subcommittee of the PSRC
September 20, 2023 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 September 20, 2023 at 4:20 PM Eastern Time. Members and guests in presence introduced themselves and indicated their affiliations. A quorum was achieved (28 out of 54 members and 29 guests).

The Subcommittee reviewed the agenda. Jonathan Sykes made a motion to approve the agenda, Don Ware seconded, and the agenda was approved with no opposition.

The May 2023 minutes were reviewed. Gene Henneberg made a motion to approve the minutes, Juan Verzosa seconded, and the minutes were approved with no opposition.

Advisory Committee Items of Interest
- 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, September 29, 2023. Please use the provided Word template and include your assignment.
- A custom web page is available for each WG, if the WG Chair wishes to use it. Contact Rick Gamble, webmaster@pes-psrc.org. A refresh of this web page is expected soon.
- There are plans to add memorials, update fellows and awards on the PSRC webpage.
- Let us know if you are interested in serving as a c-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 meeting was about 255.
- 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. Attendees were reminded to create a profile as soon as possible. More information is available at https://www.pes-psrc.org/member_planet. 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 Main Committee is expected to vote on proposed O&P during a meeting tomorrow.
- The IEEE SA style manual was revised in 2021. Working group reports should also follow word usage and other requirements described in this manual.
- 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.
- A file share application (Sharefile) for non-PAR working groups is available. If you are interested in using this, please request from Subcommittee Chair.
- 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.
- Tuesday lunch-and-learn will be a regular feature going forward.
- All are reminded and encouraged to apply for Senior Membership in the IEEE if you are eligible.
- Emails with some attachments are blocked by some participants' firewalls. Please be aware of this when sending files via email.

Working Group Reports
The minutes of the Working Groups are attached.

Old Business
None.

New Business
Attendees were encouraged to attend the informational session on Cyber-Informed Engineering hosted by the Idaho National Laboratory scheduled for 6 pm ET on September 20th, 2023.

The C25 WG finished their assignment of writing a summary paper based on the published PES Technical Report on Protection of Wind Electric Power Plants. Amin Zamani, WG chair, was not able to attend the C-SC meeting but requested the C-SC to vote on disbanding the WG contingent upon WG's approval via email. Gene Henneberg moved to disband the WG C25 contingent upon WG's approval, Chris Walker seconded, and the motion was approved with no opposition.

The C26 WG finished their assignment of revising the C37.233 IEEE Guide for Power System Protection Testing. The revised guide is published now. The C26 WG voted to disband the WG and requested the C-SC of same. Don Ware moved to disband the WG C26, Gene Henneberg seconded, and the motion was approved with no opposition.

The C39 WG is developing C37.252 Guide for Testing Automatic Voltage Control Systems in regional Power Grids. The WG chair was not present at the C-SC meeting and requested C-SC to approve extension of C39's PAR for 2 years via email. Gene Henneberg moved to extend the PAR for IEEE Guide for Testing Automatic Voltage Control Systems in Regional Power Grids for 2 years, Ken Martin seconded, and the motion was approved with no opposition.

The CTF52 recommended to form a WG to revise the C37.246 IEEE Guide for Protection Systems of Transmission-to-Generation Interconnections. Alla Deronja moved to form a WG to revise the C37.246 IEEE Guide for Protection Systems of Transmission-to-Generation Interconnections, Gene Henneberg seconded, and the motion was approved with no opposition. The new WG C52 will be chaired by Melvin Joseph Moncey. The C52 WG will review and propose any revision to purpose and scope of the guide to the C-SC before submitting the PAR.

The CTF53 recommended the C-SC to establish a new WG to develop an IEEE PES Technical Report summarizing the collection, management, and analysis of protection & control data sets for artificial intelligence and machine learning applications. Dan Sabin moved to create a new WG, Gene Henneberg seconded, and the motion was approved with no opposition. The new WG C53 will be chaired by Dan Sabin.

General Discussion
None

Adjourned
The subcommittee meeting adjourned at 5:50 PM Eastern Time.

Working Group Minutes

C23: Coordination of Synchrophasor Related Activities
Chair: Yi Hu
Vice Chair: Gustavo Brunello
Secretary: N/A
Output: N/A
PAR and PAR expiration: N/A
Established Date: 16 Oct 2015
Expected Completion Date: N/A
Draft: N/A (published)

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

Meeting Date and Time: Hybrid meeting, On September 18, 2023 at 5:00 pm EDT

Attendance: 2 members out 14 attended. 4 guests also attended.
Call to order
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. Guidance for attendees slide was not shown

Summary of Activities and Discussions

- Some background information about NASPI and the coordination between IEEE and NASPI in synchrophasor related activities were briefly reviewed and discussed for new guest attendees
- Reviewed current NASPI activities as reported at the April 2023 NASPI work group meeting
- IEEE PSRC ongoing synchronized measurement related activities were reviewed, discussed and updated
- IEEE PSCCC ongoing synchronized measurement related activities were reviewed, discussed and updated
- NASPI work group meeting date (September 26-27, 2023) and location (Charlotte, North Carolina) were announced.
- WG Chair will report IEEE synchrophasor related activities at the NASPI September meeting
- Old Business:
    - None: no new work items to be carried from NASPI to IEEE or vice versa
- New Business:
    - None

Adjourn at 6:00 EDT

Upcoming PSRC/PSCCC and NASPI Meetings:
Next WG C23 meeting will be held in conjunction with JTCM 2024 at Sheraton New Orleans, January 7-11, 2024, New Orleans, LA, USA
Next NASPI Work Group Meeting at EPRI, September 26-27, 2023, Charlotte, NC

C25: Summary Paper and Presentation on Protection of Wind Electric Plants
Chair: Amin Zamani
Vice Chair: TBD
Output: Summary Paper
Established Date: May 2021
Expected Completion Date: September 2023
Draft: Final

Assignment: Create a summary paper from C25 report

Scope: Summarize the PES Technical Report TR-87 "Protection of Wind Power Plant" to generate a summary report/paper for presentation at a suitable conference or technical venue.

Working Group C25 met on Wednesday – September 20, 2023, at 09:10–10:30AM EDT. There were total of 12 attendees in the meeting, 3 members and 9 guests.

Meeting Agenda

- Introductions
- Discuss final status of the paper.
- Review the proposed slides for WPRC (including logistics for presentation)
- Presenting at other conferences (Texas A&M and Georgia Tech)
- Decision on WG Status
- Adjourn

Summary of Meeting Discussion

a) The meeting started with the introduction of all attendees. The chair provide update on the latest status of the paper and presentation at the WPRC.
b) Dean Miller agreed to present as the chair won't be able to attend WPRC. Amin will contact the conf. chair to update the agenda for presenter.
c) The initial slide deck for WPRC was reviewed in the meeting. It was decided to focus on Type 3 & 4. The deck should be submitted to WPRC moderator by Oct. 4.
d) Amin to share the slides with the team and Dean to review.
e) The team decided to also submit abstract to other two conferences (Texas A&M and Georgia Tech).
f) Chair will email the WG members to vote on disbanding the WG as the assignment is complete. Upon approval Chair will inform the C-subcommittee Chair/V-Chair.
g) This meeting is expected to be the final meeting and no meeting will be planned for January 2024.
h) The meeting was adjourned at 09:55 AM EDT.

C26: Revision to C37.233, Power System Protection Testing Guide
Chair: Don Ware
Vice Chair: Matt Black
Secretary: Zach Zaitz
Output: IEEE Guide
Established Date: January 2016
Expected Completion Date: September 2023
Draft: Final (Published – Sep 8, 2023)
Assignment: Revise PC37.233-2009 Power System Protection Testing Guide

The in-person meeting for working group C26 was held on 9/20/23 at 8:00 EDT. There were 5 attendees. No quorum check was performed since no business was intended to be conducted.

Following typical procedure, it is the will of the Working Group (via email vote prior to this in-person meeting) to move for disbandment at the C subcommittee meeting this afternoon.

The consensus of the executives of the working group is to *not* pursue conference presentations nor a summary paper at this time. Should there be interest from any other members (or aspiring members) of the C subcommittee to lead a new WG to write a summary paper, they are invited to be made known.

Vahid Madani (our esteemed former chair [of the -2009 edition of this guide]) has seed material from presentations given for the previous edition of the guide. Should someone want to form a publicity-type working group, they would not be expected to start from scratch.

C29: Power System Testing Methods for Power Swing Blocking and Out of Step Tripping
Chair: Kevin W. Jones
Vice Chair: Mike Kockott
Secretary: N/A
Output: Tutorial
Established Date: May 2016
Expected Completion Date: May 2024
Draft: 1.10
Assignment: Create a tutorial on test instructions/parameters to accompany the PSRC documents Application of Out-Of-Step Protection Schemes for Generators, and Tutorial for Setting Impedance Based Power Swing Relaying on Transmission Lines, to aid the users in quality testing of their settings and systems when following the working group outputs which recommend testing of complex relay settings and systems.

Working Group C29 met with 12 attendees on Tuesday, September 19, 2023, 1:00-2:10 PM EDT. There were 2 members and 10 guests, with many of the guests being first time attendees.

Kevin was unable to attend, so Mike ran the meeting on his behalf.

After introductions, Mike gave a brief explanation of the background and history of C29 for the benefit of the first-time attendees.

The assignments due for this meeting were not yet completed. None working on the assignments were in attendance.

Michael Wilson and Abel Gonzalez expressed interest to assist with the assignments. Mike to discuss with Kevin.

Mike informed the meeting that the proposed survey discussed at the May meeting will most likely be cancelled.

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

Attendance

Members	Guests	
Mike Kockott	Fred Agyekum	Daqing Hou
Benton Vandiver	Kevin Malpede	Yazid Alkraimeen
	Kanchanrao Dase	Don Fentie
	Michael Wilson	Robert James
	Gene Henneberg	Abel Gonzalez

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
Established Date: May 2018
Expected Completion Date: January 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.

September 19, 2023 Meeting Minutes Hybrid Meeting

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

This meeting was in-person (Myrtle Beach, SC). The meeting commenced at 8:00 AM EST. There were 24 attendees, with 7 voting members, 2 non-voting members, and 15 non-members. Quorum was not met.

The working group began with introductory remarks by the Chair. The agenda was reviewed. Don Ware made a motion to approve the agenda, with a second from Matthew Reno. 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 for the May 2023 meeting was reviewed. No comments were raised. Minutes could not be approved because quorum was not met.

An update on the status of the Guide development was presented by the Chair and Vice Chair. Key changes to the Guide from comment resolution were reviewed.

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

The working group discussed next steps for completion of our Guide.

- Amin Zamani will send a reference to incorporate to clause 7.4.3.
- Michael Higginson will complete editing the draft with all comments resolved.
- The working group will have an opportunity to review the revised draft.
- The revised draft will be recirculated in the IEEE SA ballot for 3 or 4 weeks, considering the volume of changes.

Working group business for this meeting has been accomplished. Ratan Das made a motion to adjourn, seconded by Don Ware. There was no opposition to adjourning.

C39: IEEE PC 37.252 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: December 2022
Draft: 5.0.

Working group C39 did not meet at this meeting.

C40: Paper, Summary of C37.247 Standard for Phasor Data Concentrators for Power Systems

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
Meeting date: 5/9/2023
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.

2 Attendees (2 members): The meeting attendee snapshot is included below.

- IEEE copyright slides were shared.
- Introductions

- Status update: A tutorial had been approved in the past. However, it had to be withdrawn as it needed an in-person session, and our travel was not approved.
- We intend to propose a half day tutorial session for the next year's general meeting in July 2024. We expect to travel next year, and it should be a feasible proposition.
- The submission deadline is early November, so we should be good on that.
- We expect to continue to seek further avenues for it.

No	Name	Affiliation	Member/Guest
1	Vasudev Gharpure	Quanta Technology	C
2	Mital Kanabar	GE	VC

C41: Investigate 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, September 19, 2023, at 10:40 a.m. (EDT) with 16 in-person participants in Myrtle Beach, SC. Ken Martin (Chair) welcomed participants and briefed the WG's objective, described in the assignment above.

Ken initiated the discussion by emphasizing the importance of determining requirements for advanced distribution applications that utilize PMU measurements. He highlighted the need for accurate data in distribution PMU applications. Additionally, Ken discussed the process of categorizing different applications and their associated requirements.

Xiangyu Ding, Mital Kanabar, and Shashidhav R. Sathu expressed interest in contributing to the working group. They were subsequently assigned the task of working on distribution PMU measurement requirements.

During the meeting, working group members emphasized the significance of using true data to formulate accurate requirements. An open discussion also took place, addressing the challenges of achieving both accuracy and speed in distribution PMU applications. The need for highly accurate angle measurements, particularly in applications with minimal angle differences, was underscored. Furthermore, there was mention of vendors and research papers claiming to achieve M-class accuracy with P-class speed, prompting a discussion on the practicality of such approaches. The working group members explored the trade-offs between accuracy and speed, as well as considered other constraints associated with deploying distribution PMUs.

Ken provided an outline of the process for categorizing various distribution PMU applications and their corresponding requirements. Notably, the analysis of signals did not yield significant recommendations for changes in the PMU standard. The idea of introducing a "D class" for distribution was discussed as a potential addition to the standard. Ken also encouraged participants and volunteers to work on defining requirements for their respective application categories.

Ken reminded participants that the next WebEx working group meeting will be scheduled for November, with meeting details to be distributed closer to the date.

Recorded by Dinesh Gurusinghe.

#	**Attendee**	**M/G**
1.	Ken Martin	C
2.	Nuwan Perera	VC
3.	Dinesh Gurusinghe	S
4.	Xiangyu Ding	M
5.	Mital Kanabar	M
6.	Shashidhar R. Sathu	M
7.	David Hutt	G
8.	Abda Elandalovssi	G
9.	Dhruv Patel	G
10.	Nocholas Kraemer	G
11.	Michael Higginson	G
12.	Matt Black	G
13.	Hugo Monterrubio	G
14.	Manish Patel	G
15.	Evangelos Farantatos	G
16.	Yi Hu	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
Output: Report
Established: January 2021
Completion: December 2023
Draft: V116

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.*

Working Group C-43 met in a single-session in-person on September 20, 2023 with 35 attendees included 7 current voting 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 will be posted to PES Resource Center on September 21, 2023 per IEEE notification (After meeting note: The report is available now on PES Resource Center).

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 is planning to make a formal request for the continuation of this WG at the January 2024 JTCM meeting. If approved, the WG will work on developing this initial report into a revised report in the next two to three years. The WG will schedule additional web meetings before JTCM 2024 among WG members and interested participants to discuss and create a work plan for making the request.

Yi reviewed some potential areas for revisions/additions including a few items already proposed based on the current report. The working group participants discussed and provided their feedback on these plans.

Working group participants also discussed additional ideas for inclusion in the next version of the report. Some ideas included the need for explicability of ML + AI algorithms as well as adding more applications to the list of applications already covered.

In response to WG's call for participation, 11 working group participants had expressed their interest in contributing to the Report's revision and joining the WG.

Yi will follow up to aggregate input discussed at today's meeting and also received from current WG voting members and schedule the web meetings.

Meeting adjourned at 11:50 AM EDT.

Next meeting: Single session to be held in conjunction with JTCM in January 2024. A room for 40 people. HD projector with HDMI connector.

Avoid for PSRC B1, C23, C41, C45, H54, K18, D47/DTF47, D39, D42, PSRC B2/PSCC A2TF and for PSCC P9 and P10.

C44: Prepare a Summary Paper for IEEE Transactions on Power Delivery Based on the Contents of the Report Prepared by the C24 WG "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 2:20pm EDT on Tuesday 09/19/2023 with 16 attendees - 7 members and 9 guests.

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

It was reminded to the attendees that the original submission of the paper to IEEE Transactions on Power Delivery (TPWDR) in 2022 was rejected due to non-originality because of the publication of the TR-78 “Modification of Commercial Fault Calculation Programs for Wind Turbine Generators” by C24 WG. Then, in February 2023 the paper was submitted to the IEEE Open Access Journal of Power and Energy (OAJPE) but it was rejected. Based on the discussion at the May 2023 meeting, it was decided to submit the paper to the 2024 Texas A&M Annual Conference for Protective Relay Engineers. Meanwhile, based on discussions between Sukumar and Evangelos with the Editor in Chief of IEEE Transactions on Energy Conversion (TEC), the paper was submitted to TEC as an Application Paper. The paper publication to the 2024 Texas A&M Annual Conference for Protective Relay Engineers will be still pursued and an abstract will be submitted to keep that option open.

For the next meeting the WG will need a room of 30 with a computer projector.
Please avoid conflict with C38, C45, CTF47, C50, CTF51, B10.

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.

The attendees introduced themselves. There were approximately 13 members present, so a quorum was not achieved. Past meeting minutes will be approved via an electronic vote.
Manish Patel showed the content presently in the report.

- Aboutaleb wanted to see the section on grid-forming (GFM) inverters.
- **Sebastien** proposed a contribution of ferroresonance for GFM. He will follow up with his contribution to see if the material fits the report.
- Sukumar pointed out that, based on the slides, grid-following (GFL) inverters appears to have similarities with a PQ bus whereas GFM appear to have similarities with PV bus. For this report, we are considering talking about the fault current characteristics of GFM in Section 2.
- Manish asked what we should include regarding GFM in this report.
    - Sukumar likes the idea of comparing the GFM with GFL in the report.
    - Ratan suggested that putting information on the controls in the appendix would be a good idea. Ratan talked about “GFM enters GFL”, explaining that the IBR may remain in GFM within certain boundaries, whereas in other conditions it behaves as a GFL.
    - Amin mentioned that the critical fault clearing time is longer for microgrid-based IBRs. Sukumar says that for transmission-connected IBRs, sometimes it can decrease and sometimes it can increase.
- Manish asked about modeling considerations.

    - Sukumar says that the table approach could still apply. It would not work for microgrids because the IBR has to supply whatever is needed but could work for transmission-connected IBRs with synchronous generators. Discussion followed with Amin and Ratan discussing the nonlinear behavior of the IBR.
- Manish asked if anyone has any GFM models for a system going in service. We don't need to know which manufacturer or any details, we would like to include some plots, possibly either in the main body or in the appendix. No one has such models available for our use.
- Rich had a concern with some of the language. He said that we said GFM resists a change in frequency. But the same can be applicable to GFL. Rich said that the definition was quite nebulous and, as Manish also said earlier, there has been no consensus regarding the definition of GFM. The main advantage of GFM is that they can generate a voltage on its own.
- Rich pointed out that the challenge of the voltage-controlled current source with the independent tables.
- Rich pointed out for the fault current characteristic mainly depends on what control the IBR has. It matters less whether it is GFM versus what the GFL is. Sukumar mentioned that for the purpose of modeling, what matters more is what is the current injected for a given change in voltage at the IBR terminals. Ratan said that there is a big impact of fault time on the contribution—for the first two cycles, it is difficult to predict and after that they are usually much more stable.
- **Rich, Sukumar, Matt Reno, Aboutaleb, Amin, Yazid,** etc. to review the GFM material in Section 2 to share their thoughts.
- Manish pointed out a couple of examples of IBRs reaching 90%+ penetration at some points. Ritwik suggested adding to the introduction.
- Aboutaleb had a question for software developers. With high-penetration, it is unclear whether the issue is because of IBR control instability or possibly the solver iteration algorithm. Are there any thoughts on improving the solver to address the increase in non-linear response of IBRs? For CAPE, Yazid pointed out that there can be a limit depending on the penetration. **Yazid** will help improve the section on the non-convergence section. Load is also an important consideration, Sukumar reiterated with the thoughts captured earlier from Aboutaleb.
- **Rich** to review Section 4 on the modeling to see if the writeup aligns with the thoughts he had on the improvements relative to the tables discussed in the C24 report.
- **Mike Jensen** to adjust Section 6.2.3 to capture his thoughts related to transmission-connected IBRs. **Amin Zamani** to help ensure that there is consistency with existing C25 and upcoming C50 and to work with Mike to improve that section.
- Fred Agyekum, Milton Quinteros, David Hart, Barinton Henry, and Tapan Manna would like a copy of the report. Milton would like to contribute after he receives the email.

C46: 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

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 September 19, 2023, at 13:00 EDT with 14 attendees in person.

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

First, the scope of the taskforce was reviewed. Then, the status of the report drafted by the PSDP taskforce members was summarized. It was announced that a draft of the report has been shared with the PSDP TF members after the PSDP TF met in person in July in Orlando during the 2023 IEEE PES GM. The draft report is planned to be shared with CTF47 members in October.

Then, Aboutaleb Haddadi from EPRI presented on "NERC PRC-026 Considerations for Inverter Based Resource Dominated Grids". The presentation was well received with several questions at the end followed by a discussion mainly around inverter based resources (IBR) modeling, generic vs user defined models, and stability vs EMT models.

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.

C48: Summary/conference paper development for 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 September 2023
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, September 19, 2023, in a single session with 4 members and 8 guests attending.

The May 8 WG meeting minutes at the PSRC May 2023 were approved could not be approved because there was no quorum.

Draft 4 of the document was sent to the PSRC officers for their review and approval in May of 2023. The document was approved with a few comments. The comments were resolved, and Draft 5 was created.

The WG chair made some preliminary investigation and suggested that the WG considers writing a transaction paper to increase the visibility of the new guide. Since we did not have a WG quorum at the meeting, the WG chair will query the WG members electronically whether the WG should consider writing the transaction paper.

At the meeting, the WG reviewed the PSRC officers' comments and their proposed resolutions. There were no objections.

The paper abstract was submitted the paper abstract to the 2023 WPRC and MIPSYCON. Both WPRC and MIPSYCON declined the paper. We plan to submit it to the spring conferences (Texas A&M and Georgia Tech).

Melvin put together the initial draft of the presentation, and it was reviewed during the meeting. There were a few comments that will be considered for the presentation's next draft.

For the next meeting, depending on the decision how to proceed, we may request a room for 20 people, single session, with a computer projector.

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

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 Wednesday – September 20, 2023, at 08:00–09:10AM EDT. There was a total of 26 attendees in the meeting (12 members and 14 guests).

Meeting Agenda

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

Summary of Meeting Discussion

i) 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.
j) The chair provided an update on the status of the report/assignment. Ritwik mentioned that he has not received the link to the report. Brandon/Amin to share the link to all members after the meeting.
k) The vice-chair will email people who are reviewing the same section so they can coordinate in smaller groups.
l) It was suggested to incorporate changes from the C25 summary paper into the new C50 report (those modifications that are not reflected in TR-87).
m) The chair requested the members to provide their contribution by end of October by emailing to Chair/V-Chair. The revisions should be incorporated in the report with track changes. The chair will plan for a conference/remote call between this meeting and the next meeting in January (potentially in November 2023).
n) Rich B. suggested that discussions around anti-islanding (active & passive) requirement would benefit the report. He also suggested adding UV/OV protection for the collector feeders.
o) The team decided to add a new section on anti-islanding protection requirements to clarify on different practices.
p) Jason E. suggested to add relays points/functions to the figure provided by Manish (for Section 3). Adding some clarification that the plant could be hybrid in that section would be helpful.
q) The Chair went through the assignments/contributions provided so far. New volunteers were also identified to review the report.
r) Adding discussions on coordination between the PPC and protection system (particularly post-fault situation) was suggested. For example, ramp rate at the beginning of the day versus after the fault.

s) Chair/V-Chair will share assignment list with the attendees so that everyone can select the section they want to support in 2 weeks.
t) The meeting was adjourned at 9:10 AM EDT.

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

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: TBD

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

CTF51 did not meet at this meeting.

CTF52: Investigate interest in revising standard C37.246 IEEE Guide for Protection System of Transmission – to – Generation Interconnections

Chair: Melvin Moncey Joseph
Output: Recommendation to Subcommittee on Guide Revision
Draft: TBD
Established Date: May 2023

Assignment: Investigate interest in revising standard C37.246 IEEE Guide for Protection System of Transmission-to-Generation Interconnections

- CTF52 met on September 19th, 2023, at 3:40pm EDT
- Introductions from everyone present in the room. 20 individuals attended the meeting.
- Guide was previously published in 2017. Current guide expires in 2027.
- Chair reviewed the IEEE SA meeting guides
- Chair displayed the existing Scope Abstract and Proposal
- Chair displayed slides with New Ideas to discuss in the revised guide
- There was a discussion on IBRs especially the extent to which they need to be added to the guide since this guide was initially intended for synchronous generators.
- Proposal to revise the scope to include transmission interconnected IBRs and to not include Distribution Connected DERs. Members worked to revise the scope, abstract and proposal for the guide.
- After discussion amongst the group members, Alla Deronja motioned to revise the guide and it was seconded by Mike Jensen. The motion was approved without any objections or abstentions.

- After discussion amongst the group members, Alla Deronja motioned to revise the guide and it was seconded by Mike Jensen. The motion was approved without any objections or abstentions.
- The PAR revision including the scope and purpose were discussed.
- There was a discussion on adding BESS into the scope with respect to generation facilities and rewriting the wording for DERs.
- Alla made a motion to approve the revised scope, abstract, proposal and title. Mark McChesney seconded the motion. The motion was approved without any objections or abstentions.
- Chair adjourned the meeting at 4:50pm.

CTF53: Task Force to Study Need for an AI/ML Data Collection Working Group
Chair: Dan Sabin
Vice Chair: TBD
Secretary: TBD
Established Date: May 2023
Output: Recommendation to Develop a Technical Report

Assignment: Investigate the interest in establishing a new working group to develop a report related to collection of data related to artificial intelligence (AI) and machine learning (ML). Make a recommendation to IEEE PES PSRC C Subcommittee whether a new working group should be established.

Call to Order: The second meeting of a Task Force to Study Need for an AI/ML Data Collection Working Group meeting convened at 8:01 AM with ten attendees. Meeting notes were recorded by Dan Sabin.

Meeting Discussion
The task force reviewed the meeting notes from its last meeting in May 2023, and further discussed the questions raised at that meeting related to the topic of machine learning related to protection & control:

- Could the proposed working group review AI/ML use cases, especially the use cases described in the C43 draft report, and summarize data sets for each and which parts of the data sets are common?
- Should the working group focus on just the use cases in the C43 working group report, or should it consider new use cases as well?
- Could the proposed working group develop requirements for AI/ML data sets and gather small examples?
- Could the IEEE Std C37.239, Common Format for Event Data Exchange (COMFEDE) that could be reviewed for this report?
- What are the data sources for AI/ML projects: For example, event reports, real-time data, waveforms, device settings, sample values, etc.
- Should we identify the existing data sources and the type of data they produce?
- Are there new technologies that have become available in the past year that could be leveraged?
- Should we review existing databases or data lakes for central event collection?

- How do we overcome the challenge in getting example datasets from data owners?
- Should the working group describe a "profile" on how to use ML data?
- Should we focus on use cases where existing protection & control applications are not working as well (e.g., areas with high concentration of DER)?
- Many academic papers focus on training neural networks using simulated data; this report could focus on the importance of using real data for training ML models.
- One case study to consider is an inrush detection algorithm that focuses on waveform only; the status of the nearby breaker should be available that tells you that a breaker just closed, but may not be leveraged with the waveform.
- What are proactive things can that be done to prevent failure?
- Could we recommend a process that could be mandated by NERC on cleaning data that would enable a large data set in a central repository?
- Could we describe existing systems used now to collect and label data by electric utilities?
- Could the report be more distinct from previous work by focusing more on waveforms and/or weather data than on PMU data?
- Do possible participants in the working group have anonymous data sets already that they would be willing to share?
- Should we focus only on what we can do today with existing installed meters?
- Could we focus on applications in a chapter (e.g., model validation of DR or IBR)

Consensus of those present at the September task force meeting was that we could proceed with a formal request to C Subcommittee.

The task force reviewed and edited a draft outline of a proposed technical report. A majority of the participants present approved the following motion to request C Subcommittee to vote on the following motion:

Proposed Motion for C Subcommittee: To create a working group that would develop an IEEE PES technical report summarizing the collection, management, and analysis of protection & control data sets for artificial intelligence and machine learning applications.

The report's title would be "Collection, Management, and Analysis of Protection & Control Data Sets for Artificial Intelligence and Machine Learning Applications". The proposed working group chair is Dan Sabin of Schneider Electric. This is a proposed outline for the 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
- **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)

- **Future Trends**

Participants discussed the technical report just completed by the C43 working group entitled, "Practical Applications of Artificial Intelligence and Machine Learning in Power System Protection and Control." The chair recommended avoiding overlap of topics that were covered in depth already by that report.

If approved by C Subcommittee, the task force would meet next at the IEEE PES Joint Technical Committee Meeting in January 2024.

Adjournment: The meeting adjourned at 9:45 AM.

Attendees:

First Name	Last Name	Affiliation
Michael	Higginson	S&C Electric Company
Bernard	Matta	Schweitzer Engineering Labs
Sumit	Sawai	Schweitzer Engineering Labs
Rich	Hunt	Quanta Technology
Yi	Hu	Quanta Technology
Mark	McChesney	Oncor
Dan	Sabin	Schneider Electric
Genariel	Hernandez	Quanta Technology
Ethan	Grindle	ATC
Abder	Elandaloussi	Southern California Edison

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 (Myrtle Beach, SC) on Wednesday, September 20, 2023, from 1:10 to 2:25 PM EST.
- Officer presiding – Meyer Kao
- Officer recording minutes – Alla Deronja
- The Subcommittee meeting was called to order by the Chair
- Introductions were made by the attendees
- The meeting was attended by 28 voting members and XX guests. Quorum was met (28 out of 44).
- Minutes from the May 2023 meeting held in person were approved - motion made by Jonathan Sykes and seconded by Rick Gamble.
- Agenda for the D Subcommittee September 2023 meeting was approved - motion made by Chris Walker and seconded by Steve Conrad.

The Chair reviewed items of interest from the Advisory Committee.

- WG Chairs: please send up to date minutes to Chair and VC by September 29, 2023
- Reminders for WG Officers and D-subcommittee members:
  - Non-PAR related WGs, PSRC Sharefile Site is available for you to use
  - Balloting on WG reports, transactions papers, surveys, summary papers requires at least 75% of the Subcommittee members to Approve
  - Duties of SC members include timely responses to assignments and ballots, as listed under PSRC O&P Subclause 4.4.4
- Advisory Committee items of interest:
  - Attendance: 257 registered for the PSRC/PSCCC meetings
    - 153 for PSRC
    - 88 for both PSRC & PSCCC
  - Future Meetings
    - January 2024-New Orleans, LA
    - May 2024 – Buffalo, NY
    - September 2024 – Scottsdale, AZ
  - To all members and guests:
    - Reminder to setup your profile for MemberPlanet
    - Regardless of committee participations, individual will only have a single profile under PES
    - Link to MemberPlanet profile creation under PES PSRC webpage under Membership: https://www.pes-psrc.org/member_planet
    - Possibly using MemberPlanet for the JTCM in January 2024
  - PSRC Webmaster Rick Gamble is looking for assistance in PSRC website maintenance. If you are interested in helping Rick, please contact Rick or me.
  - Thursday morning breakfast at 7 AM
  - 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 groups gave reports on their activity.

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

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

D30: Tutorial on Application and Setting of Ground Distance Elements on Transmission Lines
Chair: Karl Zimmerman
Vice Chair: Ted Warren
Output: Tutorial
Expected Completion Date: Jan 2024
Draft 9.0
Working Group Assignment: Write a tutorial on factors affecting the application and setting of ground mho and quadrilateral distance elements on transmission lines

Working Group D30 met in person in Myrtle Beach SC on Tuesday, September 19, 2023 from 9:20 to 10:30 AM with a total of 21 attendees, including 6 members and 15 guests. We did not have a quorum, so minutes will have to be approved online.

The technical report went to a ballot of the Subcommittee on March 9, 2023. In order for the report to be approved, 33 approval votes are required. As of Monday, September 18, 2023, we had received 37 responses, 33 approved, 4 disapprove, 11 with comments. Thus, the tutorial has been approved, and are now reviewing and responding to all comments received.

The WG previously met online on June 3, June 24, and July 21 to expedite the review process. We continued this process at this meeting. Approximately 60% of the comments have been reviewed and, in most cases, have been incorporated in the tutorial.

To continue to expedite the reviews, the WG will meet for an hour on October 20, 27, and November 3 via Teams or Webex. We will invite WG members and commenters to the online review meetings.

Meeting was adjourned.

Propose a single session for 30 attendees for January 2024 with computer projector.

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 January 2024.

D35: Evaluation of Transmission Line Pilot Protection Schemes

The WG did not meet. It is expected to meet in January 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: 1.11
Assignment: Write a report on Impact of Series Compensation on Transmission Line Protection.
D37 met on September 19th 2:20pm EDT with 21 people in attendance.

Chair went through the report draft.

Plan to finish by end of November with the cleanup of all sections.

Final review of all sections by Sajal, Sumit, Daniel Ridenour, Daniel Marquis, Vijay to be completed before the next meeting in January.

Plan to resolve all comments from final review by May.

Member of utilities mentioned the need for this standard.

For the next meeting, we request a room for 25 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: 1.2
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 – Ritwik Chowdhury
4. Discuss status and progress of report
5. Review writing assignments
6. Discussion of next steps
7. Adjourn

Minutes:
Chris opened the meeting with introductions and then showed the voting membership list and asked the group to notify the officers of the working group of any discrepancies. None were noted.

The status of the report was discussed. Chris has integrated the comments received into one document.

Chris notified the room that we are working to get this published prior to the Transmission Line guide publication as we are to be referenced in that guide and cannot be referenced if we do not publish prior to the Line Guide.

Chris gave an overview of the document.

We discussed what is the definition of "High" is for SIR. A GE paper on IOC gives a value of 4 specifically. The transmission line guide is removing the references to short, medium, and long and will not define high SIR in the upcoming revision. Karl brought up to the group that we should not be bashful about giving a number. We discussed saying when you have an SIR of 4 an engineer should be looking into high SIR issues. Especially with EM relays. We came to an agreement of "at approximately 4". Chris is going to add that into the report.

Chris will review the report and ensure that references in the report are cited in the bibliography in the order that they are cited in the report.

Chris started the reviewing the comments received and we worked on resolving them.

The definition of SIR from the transmission line guide will be added to the What is SIR section and the transmission line guide will be referenced.

30 in attendance
9 Members 21 Guests

We will meet in January and request a room for 40 with projector. Please avoid conflicts with D42, D43, D53

D42: Revise IEEE Std C37.113-2015, IEEE Guide for Protective Relay Applications to Transmission Lines
Minutes for the 09/20/2023 meeting from 9:20 to 10:30 AM EDT
Chair: Jeffrey Barsch
Vice Chair: Rick Gamble
Secretary: Josh Lamb
Output: Guide
Established Date: 5/5/2020
Expected Completion Date: 2024
Draft: 1.21
Assignment: Revise IEEE Std C37.113-2015, IEEE Guide for Protective Relay Applications to Transmission Lines

a) Officers presiding – Jeff Barsch, Rick Gamble, and Josh Lamb
b) Officer recording minutes – Josh Lamb
c) Call to order – Jeff Barsch
d) Chair's remarks – Copyright and patent slides presented. No issues identified.
e) Results of call for quorum – Quorum achieved with 19 of 37 voting members
f) Approval of Agenda (motion and second) – Don Lukach 1st, Mat Garver 2nd.
g) Approval of Minutes of previous meetings (motion and second) – Chris Walker 1st, Alexis Mezco 2nd.
h) Brief summary of discussions and conclusions including any motions.
    a. Discussed the Pilot Scheme definition and changing to communication assisted protection.
        i. Alexis Mezco made a motion to keep the Pilot scheme definition as is.
        ii. Alla Deronja seconded
        iii. 18 voted for the motion
        iv. 1 against
        v. no abstention.
    b. Sebastien Billaut made a motion to change the term Pilot Scheme in Communication assisted protection

i. Ted Warren read the definition from Section 5 of "the art and science of protective relaying"
ii. Working group continued discussion with no second made and no vote was taken.

c. Discussed figure 59 in section 6.5.3 on adequate and inadequate current polarization.
i. Meyer Kao made a motion to break figure 59 into two figures
ii. Don Lukach seconded the motion
iii. Passed unanimously by working group.

d. Don Lukach asked WG members to be members of PES, SA, and have this standard in their My Project by searching for D42, check the green folder (Not yellow).

i) Action items:
a. Steve Conrad to redraw figure 59 into two figures, One for Adequate sources and one for inadequate sources by Sept 29th - Charlie Sufana to review.
b. Don Lukach to review text of 6.5.3 to match the new figure for any necessary changes by Sept 29th.
c. Jeff Barsch to post the Standard in iMeet Central for working group ballot on Monday Oct. 2 with comments due Friday Nov 17.

j) Recess and time of final adjournment: Adjourned by Jeff Barsch at 10:30 AM EDT.
k) Next meeting date and location at: January 2024 in New Orleans at JTCM

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: 2.0

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

Scope: Update the technical report "Effect of Distribution Automation on Protective Relaying" to add/increase discussion on DER integration, volt/var control, reconfiguration and the current complications of adaptation, addition of line sensors, peer-to-peer protocols, distance protection on distribution, telecommunications, DTT for DERs, discussion on IBR (Inverter Based Resources), and Microgrids. The working group will update the existing report and determine if it is advisable to recommend to the subcommittee to form a working group to use this report to create an IEEE Guide.

Working Group D43 met in-person on September 19, 2023, at 01:00-02:10PM EST. There were total of 15 attendees (4 members and 11 guests or non-voting members).

Meeting Agenda

8. Introductions
9. Review Working Group Membership
10. Discuss status of the report
11. Vote for approval of report
12. Discussion of next steps
13. Adjourn

Summary of Meeting Discussion

a) The meeting started with the introduction. The Chair shared the membership information, which shows there are 8 voting members.
b) The Chair provided an update on the latest status of the report. It was explained that the report is ready for the vote. It was discussed that 75% approval from the WG members is needed.
c) Since there were not enough members attending the meeting, it was decided that the voting will be done through email. The email will go to both voting and non-voting members for comments, but vote will only be needed from members.
d) The WG members will have 2-3 weeks to do the final review and vote.
e) The meeting was adjourned at 01:22PM.

For next meeting, we request a room for 30 people with a projector and please avoid conflicts with D38, D53, C25, and C50.

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: September 2024
Draft: 2.1
Assignment: Revise IEEE Std C37.114-2014, IEEE Guide for Determining Fault Location on AC Transmission and Distribution Lines

Working group D44 met on September 19th, 2023, at 8:00 PM ET, Face-to-face with **14 attendees.**

7 voting members were present out of **21** current voting members, so **the quorum was met.**

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

Vice-Chair Karl Zimmerman recorded minutes.
The Chair presented the latest Changes performed into **draft 2.4.2 where all figures and the bibliography were updated. Time domain fault location technique have not emerged as industry used techniques, so section 7.2 was move to informative Annex C.**
All WG review comments have been resolved.
The clean version of the Draft is 3.0.
Claire Patty noticed that technical content is present in section 1. This content will be move in section 4. A normative reference section will be added. This change will be implemented in Draft 3.1.
Chair and Vice-chair will be **seeking WG approval to form a balloting body based Draft 3.1.**
Unless there are corrections needed, WG comment are not requested. WG members will be invited to join the balloting body to provide any additional comments.
Draft 3.1 will be placed in imeet by Oct 10th.
WG approval will be requested by October 31st.
Chair will seek Subcommittee approval to proceed to balloting at the January 2024 meeting.

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.

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: Jan 2023 (under an aggressive schedule)
Draft: Initial Draft
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 9/19/23 at 2:20pm (Eastern USA Time)
Members = will be adjusted based on attendance and participation
Attendance = 30, (face-to-face, non-hybrid meeting)

Jonathan opened the meeting with the following:

- a discussion about Patent infringement (slides provided from leadership), the agenda, reviewed the minutes from the last WG,
- introduced the initial very rough draft and initiated a discussion about the status of each section from the team leads. Initial draft is 40 pages.
- leads were given action items and will modify the section per the comments discussed. Comments are included in the first draft.

For the next meeting, D45 will need a room for 50 and a computer projector.

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 15 voting members, 3 non-voting members, and 16 guests on Wednesday, September 20, 2023, at the IEEE PSRC September 2023 meeting. Two guests joined the WG as a non-voting members.

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

The meeting agenda was approved. Motion: Joerg Blumschein, 2nd: Chris Walker.

The quorum was not met, so the WG voted could not vote to approve the PSRC May 10, May 23, Jun 20, Jul 17, Aug 21, and Sep 5 webex meeting minutes. The minutes will be sent for approval electronically.

The Chair reviewed the present status of the guide revision. Most of the initial WG member comments

were addressed; some are still being resolved for all main clauses but Clause 6 *Communication channels*. This clause is still under development, and the WG leadership is working on it incorporating the comments from a PSCCC SME member.

Based on the made progress, the Chair proposed to continue with the monthly Webex meetings during the fall of 2023. If no agenda is available for a given scheduled meeting, it will be cancelled.

The WG proceeded to address the technical topics that arose during the summer 2023 webex meetings. Since there was no quorum, any items, on which opinions split, would require a quorum for final resolution.

The WG settled on using the Global Navigation Satellite System (GNSS) in the guide vs. the Global Positioning System (GPS) as a more generic term that encompasses GPS.
There was a question about whether it is communication channel switchover or failover. The WG agreed it should be failover.

Subclause 6.2.3.2 *SONET/SDH* was paired down as the redundancy related material was moved to 6.3.4.2 *Multiplexed communication channel redundancy*. It appeared there may be not enough material in this subclause. Should more be added? The consensus was that it was enough. A general concern was expressed that Clause 6 may ended up containing too much material. Tom Dahlin agreed to review 6.2.3.2 *SONET/SDH*.

In 6.2.4.3 *MPLS,* two MPLS technologies are discussed: IP/MPLS and MPLS-TP (Transport Profile).
There is a third technology: MPLS-TE (Traffic Engineering). Should it be added? If MPLS is used for corporate and protection, IT would usually use MPLS-TE. If protection choses, they will use MPLS-TP. MPLS-TE is used for protection, so it should be added.

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. The WG will be asked to use one of the following options: 1. Introduce an informal definition in the body of the guide or 2. Add formal definition to Clause 3.0 *Definitions*.

In 6.3.4.3.2 *MPLS* as part of 6.3.4 *Redundancy design considerations*, a question was raised concerning the statement, “The path switching time of less than 50ms can be achieved”. The issue is that this time is insufficient for LCD, so a redundant second channel may be needed to maintain the protection.

There was an inquiry whether the relays of different manufacturers or firmware versions of the same vendor can be applied on a line. Should we introduce a separate subclause discussing this topic in 7.0 *Application considerations*? A WG member shared that it may be possible; however, the WG felt this topic should not be added as the users should work with the relay vendors instead.

A figure was proposed to be added to 7.4 *Open CT condition*. It was decided there is sufficient material in this subclause, and the figure is not needed.

Action Items:
1. **Galina, Steve, Alla, and Chris** will review 6.0 *Communication channels*. Ongoing.
2. **Joerg** will review 5.3.3 *Digital current measurements using IEC 61850 sampled values*. Requested due date: October 15, 2023.
3. **Tom Dahlin** will review 6.2.3.2 *SONET/SDH*. Requested due date: October 15, 2023.
4. **Austin Wide** will review 6.3.5 *Interoperability*. Requested due date: August 15, 2023.

5. **Don Ware** will verify in 8.1 *General* that the referenced material to Annex B of power system testing guide C37.233 since it was revised. October 1, 2023.
6. **Don Ware** will revise 8.2 *Loopback testing* to address the following issues: utilization of an external clock to emulate the communications network timing in the case of digital communications; relay transmit/receive addressing to be made compatible; test setup preventing certain testing; and testing a single relay vs. its receiving remote current. Requested due date: October 1, 2023.
7. **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.
8. **Galina Antonova** will check the accuracy of Figure 11 in 6.2.4.3 *MPLS.* Requested due date: September 15, 2023.
9. **Joerg Blumschein** will add master/slave and merging unit topics to 7.1 *Multi-terminal line protection*. Requested due date: October 1, 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.
2. **Gayle Nelms** will contribute new material to 6.1.9 *Cybersecurity*. Requested due date: May 1, 2023.
3. **Steve Klecker** will review the tapped load reference in 4.1.2 Disadvantages for alignment with 7.17.2 *Tapped loads*. Requested due date: December 1, 2023.
4. **Joerg Blumschein, Ritwik Chowdhury, and Abu Zahid** will work to develop an Annex example to demonstrate how to properly set and apply 87L relays. Requested due date: March 31, 2023.

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

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.

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: Sep 10, 2023

Proposed assignment for WG: To prepare a report focusing on the considerations associated with single-phase tripping and reclosing on transmission lines.

1. Eight meeting of D48 working group in a single session with 34 attendees. (29 in room and 5 remote). Meeting minutes will be sent for approval via email.
2. Short discussion on outline and sections remained. Most of the sections are written but requires final review.
3. Mukesh Nagpal presented on highly compensated lines and switching transients. Good discussion.
4. Daniel briefly discussed PNM experience on PST lines near IBRs. Samir Dalal from Siemens presented is last meeting and wrote some part of this section. This section will be reviewed further and finalized.
5. Ilia discussed briefly on cross country faults. Kanchanrao Dase would like to review this section.

Ilia to review also comments so far received from Normann and Ritwik.

6. Section 8 written by Daqing could not be reviewed due to shortage of time. Will be reviewed during the next meeting.
7. BF section written by Fernando Calero is with K31 BF Guide WG. Once K31 will finalize their section on BF, D48 will finalize this section.
8. Ding spoke about Manitoba Hydro testing experience. May need further review. Also, D48 is looking for other utilities if interested to add a small section on testing. Aaron Martin from BPA is planning to discuss BPA practices.
9. Short discussion on three terminal lines and SPT. Ilia and Kamal to check with Aaron Martin and Joerg. BPA is exploring SPT on three terminal lines. Joerg also mentioned SPT is very popular in Europe on three terminal lines.
10. Call for volunteers who are interested in writing and reviewing. Please reach out to Ilia and Kamal.
11. Adjourn 11.50 AM EST.

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

Chair: Manish Patel
Vice Chair: Joshua Lamb
Secretary: Miguel Rios
Output: Summary paper
Established Date: May 2022
Expected Completion Date: December 2023
Draft: Final
Assignment: Prepare a summary paper for IEEE Std C37.104 Guide for Automatic Reclosing on AC Transmission and Distribution Lines.

The WG met on September 19th, 2023, at 3:40 pm ET with 6 members and 6 guests. A quorum was not achieved.

Officers presiding – Manish Patel, Joshua Lamb & Miguel Rios
Officer recording minutes- Miguel Rios

The May 2023 WG meeting minutes will be approved via an electronic vote.

Manish Patel noted that the summary paper is now approved by the PSRC officers. The paper is accepted for presentation at the MIPSYCON. Scott Elling has volunteered to present.

The WG members/guests in attendance then reviewed the draft of the presentation itself. Minor editing was done to the slide deck.

The WG does not intend to meet at the JTCM in January, 2024. If there is no need for the WG to meet again then an electronic vote will be conducted to disband the WG.

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: Jack Jester

Agenda:
1. Introductions
2. Review May 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

- Presenting experience, practices, operations, etc. at next WG Meeting

5. Report overview & discussion – Brian Boysen

Minutes:

- The D51 Working Group met at 8:00 on 9/20/23.
- There were **18** people in attendance (6 Members and 12 Guests).
- Meeting minutes from the May meeting were reviewed.
- Outline was reviewed. Items of note that were discussed included:
  - Phase Load Unbalance (Section 4.3)
  - Delta Connected Service Transformers (Section 4.4)
  - Discussed adding Public Safety to Other Benefits (Section 2.2)
  - Discussed direction settings (Section 3.2)
  - Discussed adding a section on 1PT-1PLO Risks to Wildfires and Weather Conditions
  - Discussed adding utility distribution survey metrics on Single Phase trip - Lock Out operations
  - Discussed Single Phase trip - Lock Out Aid in Fault Locating (Section 4.2)
- 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 - Open
  - 3.1 Ground Fault Protection – Greg Ryan and Brian Boysen (Assignment completed)
  - 3.2 Directional Settings - Open
  - 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 – Tentative: Craig Holt and Brian Boysen. Paul Harris volunteered to assist.
  - 4.1 Three Phase Customer Loads – Don Lukach and Bruch Makie (Assignment completed)
  - 4.2 DA – Aroundai Chanda and Greg Ryan
  - 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) Discussed expansion of “voltage backfeed”
  - 4.5 Fallen Conductors – Kamal Garg and Brian Boysen
  - 4.6 Substation Inbalance – Open
  - 4.7 DER – Greg Ryan and Muhammad Hamid volunteered
  - 4.8 Operational Considerations – Paul Harris and Daqing Hou volunteered

Meeting Requirements for January

Room for 35 with Projector; single session. Meeting Conflicts: D53, K29, CTF51

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

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

DTF53: Task Force on investigation forming a Working Group on “Distribution Line Protection Practices Industry Survey”

DTF53 met today with 18 members and no guests. We had a good discussion on the previous surveys and

questions that we would like to ask in a new survey that were different than previous questions. Survey's of this type have been completed in 1983, 1988, 1995, and 2002. There was a majority in the room who expressed interest in participating in a working group to create a new survey. We discussed the survey and assignment for the upcoming working group and determined and assignment and title. We also discussed in the working group about adding questions that were related to today's issues. Some examples were IBR and HIZ Faults. We have interest in the officer roles of the working group.

At the D-subcommittee meeting on Wednesday, September 21, 2023, task force chair, Greg Ryan, made the following Motion to form a working group with below title and assignment.

Title: Report on distribution line protection practices survey

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.

The motion was seconded by Brian Boysen. There were no objections.

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

D-Subcommittee Balloting:
Both D30 & D50 outputs have met the 75% balloting approval threshold for them to be published
D30: Tutorial on Application and Setting of Ground Distance Elements on Transmission Lines
D50: Create Summary Report on C37.104 IEEE Guide for Automatic Reclosing for AC Distribution and Transmission Lines

New Business

Russ Patterson proposed to start a task force in January to research and document sensitive ground fault protection on distribution lines. Some topics to be investigated are grounding techniques that may or may not be in the D-subcommittee scope and protection for high impedance and low amperage faults.

While there is a solidly grounded system in the North America, the Europeans use different grounding methods in their systems and apply protection methods that are not known in North America. On the other hand, we do not have these systems. WG D45 got the material related to the European grounding methods that can be used in the proposed project.

Russ Patterson made a motion to create a TF, tentatively named Protection methods for non-effectively grounded distribution systems. The motion was seconded by Scott Hayes. 23 members approved the motion and 5 abstained.

Task Force DTF54 will meet in January in a single session. The DTF54 chair will be Russ Patterson.

Murty Yalla noted it is hard to find reviewers for papers discussing HVDC transmission/dc distribution systems. These systems include control systems. It would be good to work with the HVDC and FACTS subcommittee of the T&D committee and recruit the HVDC vendors.

Murty Yalla made a motion to create a TF to investigate a future course of action for protection of HVDC transmission/dc distribution systems and set up a liaison with the T&D HVDC subcommittee.

The motion was seconded by Nuwan Perera. 25 members approved the motion and 3 abstained.

Task Force DTF55 will meet in January in a single session. The DTF55 chair will be Brandon Lewey.

General Discussion

D35 is ready for Subcommittee D balloting for the WG technical report. It will be distributed to the SC members in a October timeframe for review and approval.

Don Lukach mentioned that Std 643 dealing with PLC applications is maintained by PSCCC and being revised by WG C1. More participants with the protection background are needed, so any D-subcommittee members are encouraged to participate in this project.

If anyone has a L&L proposal, please send them to the PSRC leadership.

Line protection operations of interest
None

Adjournment

H: RELAYING COMMUNICATIONS SUBCOMMITTEE
Chair: Aaron Martin
Vice Chair: Hugo Monterrubio

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.

The H SC met on Wednesday September 20, 2023, in person in Myrtle Beach, SC with 33 members and a number of guests. Quorum was established. The May meeting minutes were approved. Jose Ruiz and Dan Sabin were introduced as new members of the H SC.

Announcements

1. New items from the September 2023 AdCom Meeting
    a. PSRC members to vote on P&P and O&P Manual revision at MC meeting.
    b. Reminder to point contacts to the knowledge base on PSRC webpage.
    c. Reminder for all HWG to update membership lists.
    d. There is a proposed lunch-and-learn for Member planet at the next PSRC meeting.
2. New items from Awards and Recognition Meeting
    a. The awards ceremony was held Monday night. Congratulations to all the award recipients.
    b. The next awards ceremony will be on Monday May 13, 2024 in Buffalo, NY
3. New items from SC and reminders carried from prior meetings:
    a. Reminders:
        i. WG officers to attend Stds Coordination meeting
        ii. SC Members are required to Vote on Reports
        iii. iMeet space available for Non-PAR WGs. PSRC Officers have organized documents depository for non-PAR WGs
        iv. WG presentations to be reviewed by SC Officers
        v. Upon work completion, prepare a presentation to the MC.
4. Standards Nearing Expiration (2023 or earlier):
    a. IEEE Guide H22 PC37.249 for Categorizing Security Needs for Protection Related Data Files
    b. IEEE Standard PC37.251 Standard for Common Protection and Control Settings or Configuration Data Format (COMSET)
    c. IEEE Standard 1646, Standard for Communication Delivery Time Performance Requirements
    d. IEEE Recommended Practice PC37.1.3 Recommend Practice for Human-Machine Interfaces (HMI) used in Substation Automation Systems for two years.

WG Business
Please submit your meeting minutes within 15 days (two weeks) as required by our PSRC WG P&P an include any changes to the MRR for the September meetings.

1. WG H17 Completed Technical Report Establishing Links between COMTRADE, IEC 61850, and CIM Chair: C: Brunner in 2021. Comments were received in Spring of

2021. WG H17 has completed addressing all comments. Original commenters will be asked to review latest draft of report.

2. PAR Extensions Requests:
    a. WG H22 PC37.249 Guide for Categorizing Security Needs for Protection Related Data Files is in comment resolution in SA and submitted a request to HSC for approval submit 1 year PAR extension. HSC Chair: A, Makki
        i. Motion by: Craig Preuss
        ii. Seconded by: Deepak Maragal
    b. WG H27 PC37.251: Standard for Common Protection and Control Settings or Configuration Data Format (COMSET), did submit a request for a 1 year PAR extension upon electronic approval by the HSC this last summer. Chair: M. Capuozzo
        i. Motion by: Jose Ruiz
        ii. Seconded by: Matt Black
    c. WG H41 P1646:, Revision of 1646 Communication Delivery Time Performance Requirements did submit a request for a 2 year PAR extension upon electronic approval by the HSC this last summer. Chair: D. Dolezilek
        i. Motion by: Jose Ruiz
        ii. Seconded by: Matt Black
    d. WG H46 PC37.1.3:, Recommended Practice for Human-Machine Interfaces (HMI) used in Substation Automation Systems did submit a request for a 2 year PAR extension upon electronic approval by the HSC this last summer. Chair: M. Black
        i. Motion by: Matt Black
        ii. Seconded by: Jose Ruiz
3. Requests to form a sponsor ballot
    a. WG H40 PC37.1.2 : Recommended Practice for Databases Used in Utility Automation Systems motion to IEEE-SA for Sponsor ballot was approved by HSC. Chair: T. Laughner
    b. WG H46 PC37.13 : Recommended Practice for Human Machine Interfaces (HMIs) used with Electric Utility Automation Systems to IEEE-SA for Sponsor ballot was approved by HSC. Chair: M. Black
    c. WG H51 PC37.239 : Standard IEEE P37.239 Standard for Common Format for Event Data Exchange (COMFEDE) motion to IEEE-SA for Sponsor ballot was approved by HSC. Chair: M. Adamiak

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.

Tuesday September 19, 2023 Myrtle Beach, SC Room: Atlantic C

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

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

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

You can find the technical report at: http://www.pes-psrc.org/kb/published/reports/H6_17.6_Application_Testing_of_IEC_61850_Based_Systems.pdf and at Application Testing of IEC 61850 Based Systems (ieee-pes.org)

This meeting was in-person and was also on Zoom (no one attended the Zoom session).

There was 1 voting member, 1 non-voting member and 3 non-members present.

Main emphasis of the session was to review the comments from the H subcommittee vote on the latest summary paper draft. There were 3 negative ballots and 103 comments were submitted.

Chairman Charlie Sufana indicated that he had cleared about 92% of the comments prior to the meeting. However, there were 8 comments that warranted working group review. At the meeting there were some suggestions for Haveron comment #11, Preus comments #1 and #19, Verzosa comments #1 and #2, Antonova comments #8, #21, and #24. These comments will need further review via an on-line meeting.

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

Charlie Sufana
H6 Chair

Voting members attending: 1 out of a total of 18 voting members

NAME	AFFILIATION
Charles Sufana	Retired

Non-voting members attending: 1 out of total of 15 non-voting members

NAME	AFFILIATION
J. Scott Cooper	Omicron

Non-members attending 3

NAME	AFFILIATION
Fawaz Adesina	Entergy
Laurel Brandt	TVA
Mathew King	HDR Engineering

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

Call to Order: The meeting was called to order by Vice Chair Benton Vandiver at 2:22 PM. Meeting notes were recorded by Dan Sabin.

Quorum: 3 of 11 working group members attended, resulting in no quorum.

Initial IEEE SA Ballot: Malia Zaman's reviewed results from the initial SA Ballot, which opened on 2023 April 9 and closed on June 20.

Comment Resolution: Comments received during the initial SA Ballot are being reviewed and resolved by the working group. Approximately 20 comments are editorial, 60 are technical, and 10 are general comments. About half of the comments were reviewed and resolved by working group leadership during two online meetings in August.

PAR Extension: Vice Chair Benton Vandiver submitted a PAR extension request online with Malia Zaman's assistance.

Next Meetings: The next meeting of the H27 PC37.251 Working Group should be a web meeting on October 30, which will focus on resolving the remaining comments and reviewing/approving changes already addressed by working leadership. WebEx invitations will be sent to the full working group as soon as possible.

Old Business

PAR Extension: During the IEEE PES PSRC H Subcommittee meeting on May 10, a one-year PAR extension was approved by the subcommittee.

Adjournment: The meeting adjourned at 3:15 PM.

Action Items:

The vice chair will request approval of the PAR extension to IEEE NesCom during the IEEE PES PSRC H Subcommittee Meeting on September 20.

Attendee List:

First Name	Last Name	Affiliation
Daniel	Sabin	Schneider Electric
Benton	Vandiver	Hitachi Energy
Malia	Zaman	IEEE Standards Association
Craig	Preuss	Black & Veatch

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 23 attendees + 4 online attendees

IEC 61850 implementation experiences from SaskPower, Canada → Elemer Demeter were shared to the group with following key notes:

- SaskPower adopting IEC 61850 GOOSE, MMS on all greenfield substations, and performing replacements on brownfield substations.
- SaskPower is savings significant amount of time, engineering effort, testing effort, construction space, copper wiring with adoption of IEC 61850
- Staff training involved on all aspects → Operations, Testing, Field services.
    - Lessons learned were to spend more time on training

In continuations to previous meeting's discussion on interoperability issues

UCAIUG (Joel Greene) presented their perspective and work being done on IEC 61850 editions and profiles.

- The differences in implementation in Simulation attribute between Edition-1 and Edition-2, Synch attribute between IEC 61869-9 were discussed.
- Alex Apostolov mentioned the difference between IEC 61869-9 defining samples per second vs IEC 61850 defining sample per cycle.
- Deepak mentioned the need to provide further guidance to industry on highlighting the version differences and indicating the upgrade path. The group discussed and suggested to discuss the version differences in the next meeting.

The chair indicated the interest to include in future meetings the real-world implementation experiences from Centralized Protection System (CPC)

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 4 guests

Chair discussed the draft report in PES format that included the data representation, data type, model and application of logical node topics. Following aspects were discussed:

- Discussed on how much the data representation details need to be included in the report as content and as reference.
- The proposed model of H31 logical model included Input, Output, Settings section. Model details were compared with IEC 61850-90-30 draft report and the best practices were to be looked in defining the model.
- Alex Apostolov suggested decreasing the scope to include the models for only few logical nodes and not all Pxxx, Rxxx.
- The group discussed having web-meetings to progress the report.

H40: Databases used in SAS

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

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

H40 met this morning with quorum (5/7 members present). We approved the agenda and previous minutes.

Most importantly, the working group approved initiating a ballot pool for draft 9 of the guide. Consequently, we would like to request approval from H subcommittee to initiate a ballot pool for P37.1.2/D9. We would like to meet at the JTCM to work on ballot comments.

H41: Revision of IEEE 1646 Communication Delivery Time Performance Requirements

Chair: D. Holstein
Vice Chair: T.W. Cease
Output: Standard
Established: 2017
Completion Date: 2021
Draft: 5E4

Assignment: Revision to IEEE Standard 1646-2004

Met with no quorum

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.

Purpose: To provide guidance to protection & automation engineers when applying monitoring features IEC 61850 GOOSE messages and Sampled Values to support the implementation of condition-based maintenance, cyber security monitoring and improved commissioning of communications of automation systems.
Quorum was not achieved at the beginning of the meeting, but it was achieved to a total of 10 members out of 17 as the meeting continued.

Once quorum was achieved, a motion to approve the past minutes of the meeting was made by Jun Verzosa (first) followed by Benton Vandiver (second). Meeting minutes were approved.
Patent, IEEE guidelines and code of conduct, and copyright slides were shown to attendees.
Current document draft version is 5.0.
Craig Preuss reformatted the entire document and now there is a complete draft, which contains more than 100 pages.
There are not standing assignments at the moment.
A dialog during the meeting was held and Craig Preuss explained that there is redundancy between the monitoring and diagnostic items on the document. It was suggested to either explain why they are different, or go with the idea that they are the same and combine these two sections, i.e. to combine sections 5 and 6.
Herb Falk pointed out sections 6.3 and 6.4 that refers to monitoring. These are not really referring to diagnostics. Titles are not really diagnostic.
Aaron Martin proposed to the group to remove “cyber security monitoring” from the working group document purpose. No response was given to this. No support to this proposal was made during the meeting.
Alex Apostolov summarized that the Group agrees that monitoring is used to diagnostic an abnormally/failure.

Herb Falk and Karen Legget-Wyszczelski will work with Craig Preuss to address proprietary information. An offline meeting will be scheduled to discuss this. Afternoon Eastern Time works better for Herb Falk.
Jose Ruiz was invited by H44 Chair to fill the role as Secretary. Jose accepted the invitation.
Scott Mix of SEL suggests not to call it proprietary.
Meeting was adjourn, Karen Legget-Wyszczelski first and Herb Falk second.

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

Members		
NAME	AFFILIATION	
Aaron Martin	BPA	X
Alex Apostolov	Omicron	X
Arun Shrestha	SEL Inc.	
Benton Vandiver	Hitachi	X
Craig Preuss	Black and Veatch	X
David Dolezilek	SEL Inc.	
Dean Ouellette	RTDS	
Dustin Tessier	Tesco	
Emmoji Vundekari	GE	
Eugenio Carvalheira	Omicron	X
Herbert Falk	Outside the Box	X
Jose Ruiz	Doble Engineering	X
Jun Verzosa	Doble Engineering	X
Karen Legget-Wyszczelski	SEL Inc.	X
Nestor Casilla	Doble Engineering	
Ryan Newell	TRC Companies	
Scott Mix	PNNL	X
Guests and Past Guests		
Abel Gonzalez		
Alexander Pratniczka	Hitachi Energy	
Amin Banaie	GE	
Andre Melo	SE	X
Andre Uribe	Power Grid Engineering	
Angelo Tempone	Duke Energy	
ArundoDai Chanda	Burns & McDonnell	
Bharat Nalla	SEL Inc.	
Byungtae Jang	Naver	
Charles Pestell	Powell	X
Christoph Bruner	It4power	
Dan Ransom	GE	X
Daniel Nordell	Xcel Energy	
Daqing Hou	SEL	X
Darren DeRonde	Tesco Automation	
Dinesh Gurusinghe	RTDS	
Duruv Patel	Bechwith Electric-Hubbell	X

Emmoji Vunderkari	GE	
Farzad Khalilpour	GE	
Fernando Calero	SEL Inc	
Gayle Nelms	SEL Inc.	
Greg Zweigle	SEL Inc.	
Hani Al-Yousef	Eaton	
Hugo Monterrubio	Hubbell / Beckwith	X
Jack Wilson	Ameren	
Jay Anderson	SEL	X
Jay Shumar	Hitachi Energy	
Jeff Dagle	PNNL	
Jeff Pack	Power Engineers	
Jesse Sliva	SCE	
Jim Hackett		
Joe Xavier	ABB	
Joel Green	SISCO	X
Jorg Blumshein	Siemens	
Jorge Cinton	USNRC	X
Marcos Velazquez	Doble Engineering	
Mario Capuozzo	Doble Engineering	
Matt Black	Sargent Lundy	X
Michael Cummingham	Power Grid Engineering	
Mike Basler	Basler Electric	X
Mike Dood	SEL	X
Mital Kanibar	GE	
Mohit Sharma	SEL	
Nelson Perilla-Sanchez	NCS	
Nicholas Kraener	National Grid Power	
Nuwan Perera	Earlphase	
Orville		
Pail Myrda	EPRI	
Priyanka Nadkar	SEL Inc.	X
Rich Hunt	Quanta Technology	
Romulo Bainy	University of Idaho	
Safety Pepljak	YRC Companies	
Scott Short	Doble Engineering	X
Shane Haveron	Ametek	
Shivam Prabitakar	Siemens	X
Thai Li	Hubbell	
Thomas Rudolph	SE	
Wang Zitao		
Wayne Pawley	Sisco	
Xiangyu Ding	S&C E	
Yanfeng Gong	SEL Inc.	
Yuchen Lu	EPRI	
Yujie Yin	GE	

For future meetings, H44 will need a room for 25 people with supporting projector and teleconferencing capability.

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: 6.401

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

(Face-to-face) Meeting # 45 (September 20, 2023) Notes

The working group met on September 20, 2023 with 44 attendees - 10 of them are voting members (out of 29), one is a non-voting member (out of 8) and 33 guests. The names and affiliations of attendees are enclosed in Annex I.

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

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

Chair also provided status of the IEEE Ballot Group formation and results of the IEEE Initial Ballot for the benefit of non-member participants at the meeting. IEEE Initial Ballot 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 the participants that WG is meeting every alternate week virtually since August 11, 2023 to discuss and dispose comments. WG will take next few months to dispose all comments as per IEEE SA procedures and expects to have a recirculation of the draft guide during the first quarter of 2024.

Chair then informed that minutes of the last WG (virtual) meeting (held on Sep 08, 2023) circulated via email dated Sep 12, 2023, were approved without any modifications. No further comments were received during the meeting.

Chair then presented the approval details for the comment dispositions requested via email dated Sep 12, 2023. Chair informed that new resolutions (item 4 in the approval request email)

approval deadline will be extended to Sep 27, 2023 to provide enough time to all members who did not get a chance to respond – WG members will be informed about the extension via a separate email.

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-465 (Commenter Joe on the disposition details was not present)

I-1259 (IEEE ballot group commenter was also present during the meeting along with some of the WG commenters and all agreed with the proposed disposition),

I-427, I-1136, I-892, I-1255, I-550, I-466 and I-426 (WG Commenter Craig on the disposition details was present and agreed with the revised proposals except for I-466, where reference of the standard will be added to the disposition details).

Updated disposition details of abovementioned comment # will be sent to WG members for approval.

Discussions was then held on comment # 1114 related to referring C37.240 in the guide as this standard will expire. It was decided to keep this standard reference in the guide till in the bibliography as the standard has useful information. Chair will request approval from WG members for the disposition details of this comment.

WG will continue to meet every alternate week with a meeting duration of one hour. Occasional longer duration meeting will be organized as necessary to expedite the comment disposition process.
Meeting was then adjourned (Motion: Hugo, Second: Jose, Dissent: None).

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

The chair called the meeting to order on Tuesday 9/19/23 at 8:00 EDT. There were 13 attendees: 8 voting members and 5 guests, reaching quorum.

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

The PAR extension for WG H46 has been submitted and is on the NESCOM agenda for 10/24/23.
All 57 WG ballot comments have been resolved. The WG has unanimously approved the draft to move forward to the SC for approval to go to IEEE-SA Ballot. The motion has been sent to the H subcommittee leadership for inclusion in the 9/20/23 H SC Agenda.
At the next meeting we will tentatively request room for 25 with a projector (If IEEE Balloting is not complete, the meeting may be cancelled). Please avoid conflicts with D47, I31, J24, H27, H51, H52, C26, & S15.

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.

WG H47 met on Tuesday, September 19, 2023, at 1:00 p.m. (EDT) with xx in-person participants. Mital Kanabar (Chair) extended a welcome to the participants and provided a comprehensive overview of the WG's scope, purpose, and objectives. He also shared an update on the current status of the WG.
During the meeting, participants discussed various aspects of centralized and virtualized systems in the context of process bus applications, particularly focusing on the potential impact of abnormal conditions on protection and control applications. The discussion began by addressing the distinction between centralized and virtualized systems. Centralized systems were defined as having multiple protection and control applications within a single system, while virtualized systems involved abstracting hardware from the applications. Members debated whether this distinction was necessary, with some arguing that virtualized systems inherently encompass centralized aspects.
The conversation shifted to the importance of testing in centralized and virtualized systems. Participants stressed the need for careful consideration during the engineering process to ensure that protection and control functions were made visible for testing purposes. The point was raised that visibility is crucial for testing and should be achieved through GOOSE messages or other means. Additionally, it was suggested that a standardized approach should be established for testing virtualized environments.
A question was raised about how redundancy works in centralized systems, specifically when there are two online systems with the ability to transfer between them during testing. Participants acknowledged the complexity of this issue and highlighted the importance of defining redundancy configurations and communication between the systems. It was noted

that different organizations may implement redundancy differently, and there is no one-size-fits-all solution.
The use of test-bit in testing centralized systems was discussed. Members emphasized the importance of using test-bit to subscribe to sampled values from a test device, allowing for isolated testing of components without affecting other parts of the system. It was suggested that test-bit usage should be considered when designing and implementing centralized systems.
The meeting concluded with a call for volunteers to make presentations in future WG meetings. Members were encouraged to share their experiences, test results, or insights related to abnormal conditions and their impact on protection and control applications in digital substations. Presentations would ideally focus on process bus, sample values, GOOSE messaging, and any potential solutions or best practices.

Recorded by Dinesh Gurusinghe.

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

Chair: Acting – S. Klecker
Vice Chair: G. Antonova
Secretary: L. Erichsen
Output: Report
Completion:
Current Revision:

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.

H49 didn’t meet

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 (following meeting)

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 19 September 2023, 08:00 – 09:10 EDT at the Doubletree Resort by Hilton Myrtle Beach Oceanfront, Atlantic A, called to order 08:05am. Vice Chair Anderson presided; chair Ouellette was unable to attend. Nicholas Kraemer volunteered to record minutes.

21 attended; initially quorum was not achieved so minutes were not approved (it was not noted when quorum was ultimately achieved with 7 members in attendance).

Patent slides and Copyright policies were shown, and all participants asked to speak up about any patent claims at this time. No claims were offered. The IEEE Participant Behavior slides were also shown.

New Business
Review draft 1.7.3.
The Vice chair noted some changes that were made by the Chair and Vice chair; these had been posted previously to the iMeet site.
The reference to C37.238a needs to be updated since the amendment has been approved and should be published before the H50 report is finished.

Topics outstanding needing writing assignments:

- Section 3.4 on regulations. A volunteer was found (Aaron Martin)
    - IEEE 2030.101-2018 "IEEE Guide for Designing a Time Synchronization System for Power Substations" should be referenced. A volunteer was found to read 2030.101 & highlight relevant sections for this report (Rich Hunt)
    - Clock requirements are not typically directly regulated, but accuracy requirements imply certain timing requirements.
- Section 3.5 on security. A volunteer was found (Herb Falk)
    - 3/4 areas identified: Security of clock management, security of synch messages, diversity of sources/input signal integrity
    - ISA 99 wg14, time security may be relevant
    - C37.240 was investigating, but is on hold pending ISA work
    - Desire is to keep this section short as a brief overview, and point to ongoing other work
- Part of Section 3.6: Event Logging.
    - Should include typical generic items that should be recorded
    - Content was re-organized into use cases (real time monitoring, post event analysis, centralized monitoring)

Suggestion to rename Section 5 (last section reviewed for his meeting). Renamed from Applications to Application Requirements, and look at what time precision may be required for what applications. A volunteer was found (Prianka N).

Further discussion will be needed to determine what notification schemes may be required to allow for system operation in abnormal conditions.

Scott Mix brought up recent real-world experience with Phasor Measurement Units (PMUs) marking data unusable following loss of the GNSS signal while the clock still should have been within usable holdover accuracy. There was discussion on whether the issues involved included standards and implementations on the clocks or on the PMU application as realized in the IEDs receiving clock information. The consensus was that there may be issues with how clock accuracy (or inaccuracy) is reported from the clocks and how time quality flags are interpreted by the PMUs. Members agreed to raise the issues with P20 (61850-9-3 revision) and with P9 (currently working on a revision of C37.247 and C37.118.2).

The meeting was adjourned after the scheduled time.

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 (for the JTCM, include provisions for virtual attendance).

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

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 didn’t 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.

No minutes

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: 20230918

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

- Introductions were done and attendance was taken
  - 3 online, 18 in person
  - Quorum was not met
- Standard IEEE meetings slides were reviewed
  - No one mentioned any issues with patents
- It was recommended to add substation based FLISR in the FLISR write-up as a 3rd option to consider.
  - There was some discussion about whether this was just another version of centralized schemes.
    - Some additional text was added to address this concern.
- It was also mentioned that manual switching is typically done as part of some FLISR schemes after automatic switching is completed.
  - It was mentioned that this is typically considered optimization and not FLISR and is not something mentioned within the scope of the document.
- The new communications architecture diagram was reviewed and discussed
  - No additional changes were recommended for this diagram
- The next section that was reviewed was around the changes and updates made to the VVO areas
  - It was recommended to change “DNP 3-enabled devices” to “Communications enabled devices”, which was later changed to “DA devices”
  - It was mentioned that IEEE 1547 has DER profiles that may impact power factor optimization and VVO and there is nothing in the current guide that mentions this (DER is covered in hosting capacity)
    - Tony Johnson (SCE) said he would help write something up that could be considered for additional information for the guide concerning this
  - Sal mentioned that P1885 was also recently released and may need to cited as how to measure and verify VVO/CVR
  - The new table that was put into the VVO section was reviewed
    - No changes were suggested
- The next section that was reviewed as the power quality section
  - New reference to IEEE 1159 was made as well as new communications write-up
- The next section that was discussed was Optimal Network Reconfiguration
  - Need to add communications to this section

  - Need to look over the application write-up itself and make sure it aligns to how ONR is done today (e.g., not just seasonal changes, manual switching based on recommended switching actions from ADMS, as well as automatic switching, after a FLISR event)
- Meeting adjourned at 2:10 PM EDT

Future Meetings:

- Bi-Weekly Working Group Meetings through the T&D Working Group
- Joint H53/P16 Meetings during PSRC/PSCCC Meetings

Attendee List

Members	
NAME	**AFFILIATION**
Xiangyu Ding, H53 Chair	S&C Electric Company
Jason Lombardo, P16 Chair	S&C Electric Company
Craig Preuss	Black & Veatch
Anthony Johnson	SCE
Sal Martino	Duke Energy
James Bougie	Albireo Energy
Guests	
Randy Roberts	Southern Company
Ding Lin	Manitoba Hydro
Daqing Hou	SEL
Bernard Matla	SEL
Briyanka Nadkar	SEL
Karen Wyszczelski	SEL
Joel Greene	SISCO
Paul Harries	Pacificorp
Nicholas Kraemer	NuGrid Power
Dhrur Patel	Beckwith Electric
Rafael Garcia	Oncor
Sajal Harmukh	SEL
Sumit Sawai	SEL
Mark Adamiak	Consultant
Kanchanrao Dase	SEL
Jun Verzosa	Doble

H54: Revision of IEEE C37.111-2013/IEC 60255-24:2013 Standard for Common Format for Transient Data Exchange (COMTRADE) Dual Logo Maintenance Team

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 fourth 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: 14 of 27 working group members attended, which resulted in quorum.
Required IEEE SA Slides: The slides for essential patents, copyright policy, and participant behavior were shown by Dan Sabin. A call for essential patents was made and no essential patents were identified by the participants.
Meeting Discussion:
Here are some of the topics that were discussed during the meeting:

Proposed XML Configuration File

- The proposal file prepared by Zack Makki for a COMTRADE configuration file formatted in XML was reviewed in a presentation by Mark Adamiak.
- The working group participants discussed whether the XML elements should use the names from the existing COMTRADE-2013 standard (e.g., “lf” for line frequency or whether new, more readable elements should be introduced (e.g., “line_frequency”).
- The working group discussed the need for including spatial coordinates in the COMTRADE file (that is, latitude and longitude) and whether the coordinate system (e.g., WGS 84) needed to be specified in the COMTRADE standard. The answer was YES.
- 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.”
- The chair discussed how the example could be expanded to include INF files and HDR files.

Proposed Container Format

- Dan Sabin presented a proposed new normative annex that would specify how to store a single COMTRADE record (e.g., a single CFG and DAT file or a single CFF file) compressed in a Zip file.
- A suggestion was made and adopted to rename the proposed container format file from “CCFZ” to “CCFX” to be consistent with Microsoft conventions for DOCX, XLSX, PPTX files.
- Consensus was that the proposed contribution was good, but it did not go far enough because only one observation record could be stored.
- Sabin agreed to expand the contribution for the next meeting to show an example of storing more than one COMTRADE record in a single Zip file using a single level of subfolders.

Virtual Channels

- Ellery Blood presented a draft contribution regarding virtual channels.
- The working group discussed whether virtual channels should start with the letter “v”.
- There was discussion on the need for virtual channels could be eliminated if there were better requirements on channel identification. That is, a better identified channel could allow a post-processing application to derive virtual channels using its own logic rather than logic defined by equations in the definition of a virtual channel. As a counter argument, there is a possible requirement by NERC not wanting to have to figure out the logic when reading files from different vendors.
- The participants discussed the need to define and/or restrict the mathematical expressions

possible with the virtual channels, such as addition, subtraction, multiplication, division, and simple functions like exponents and trigonometry.

There was discussion on whether the first implementation of virtual channels should be kept “simple”, such as only allowing a limited number of nested expressions.

There was discussion of a possible open source grammar parser for virtual channels that could be developed in IEEE SA OPEN as part of a project independent of the PSRC working group.

Next Meeting: The H54 DLMT will meet in person at the IEEE PES Joint Technical Committee Meeting in January in New Orleans.
Adjournment: The meeting adjourned at 10:30 AM.

Action Items:

The working group members should review the proposed XML configuration file and provide comments.

Dan Sabin should expand the proposed new normative annex by specifying how to store more than one COMTRADE record in a single Zip file.

The working group members should review the proposed virtual channels contribution and provide comments.

Attendee List

The following 33 people attended the COMTRADE DLMT meeting.

First Name	Last Name	Affiliation	Voting Member?
Mark	Adamiak	Adamiak Consulting	Yes
Fawaz	Adesina	Entergy	
Hani	Al-Yousef	Eaton	Yes
Orville	Anderson	ECF Consultants	
Thierry	Bardou	Schneider Electric	Yes
Ellery	Blood	Schweitzer Engineering Laboratories	Yes
Jörg	Blumschein	Siemens	Yes
Ritchie	Carroll	Grid Protection Alliance	Yes
Kanchanrao	Dase	Schweitzer Engineering Laboratories	
Milo	Daub	Mesa Associates	
Xiangyu	Ding	S&C Electric Company	Yes
Jean-Sebastien	Gagnon	Vizimax	Yes
Rafael	Garcia	Oncor	
Abel	González	Megger	Yes
Joel	Greene	SISCO	
Ethan	Grindle	ATC	
Dinesh	Gurusinghe	RTDS Technologies	
Sajal	Harmukh	Schweitzer Engineering Laboratories	
Yi	Hu	Quanta Technology	
Nallan	Kumar	Schweitzer Engineering Laboratories	
Deepak	Maragal	Eureka Power Solutions	Yes

First Name	Last Name	Affiliation	Voting Member?
Mark	McChesney	Oncor	
Shashidhar	Reddy	Schweitzer Engineering Laboratories	Yes
Randy	Roberts	Southern Company	
Daniel	Sabin	Schneider Electric	Yes
Sumit	Sawai	Schweitzer Engineering Laboratories	
Scott	Short	Doble Engineering	
Brian	Smyth	Schweitzer Engineering Laboratories	
Eric	Thibodeau	Hydro-Québec	Yes
Gonzalo	Vara	ARTECHE	Yes
Jun	Verzosa	Doble Engineering	
Mike	Wilson	Megger	
Malia	Zaman	IEEE Standards Association	

The following voting working group members were not in attendance:

Mario Capuozzo
Gopal Gajjar
Shane Haveron
Nicholas Kraemer
Theo Laughner
Zach Makki
Andre Melo
Bruce Muschlitz

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.

No minutes

Old Business

- None

New Business

- None

Adjourn

IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

IN-PERSON MEETING – Myrtle Beach, SC
Wednesday September 20, 2023, 1:10 PM to 2:35 PM Eastern Time

I SC – Protection and Control Practices* Scope:
Evaluate and report on all matters related to protection and control practices for compatibility with the physical and electrical environment (including but not limited to equipment withstand capabilities to electromagnetic interference), characteristics and performance of instrument transformers and sensors, equipment and system testing procedures, protection and control performance criteria and applications, event/transient recording, and definitions of protection and control systems. Develop, recommend, establish, and maintain standards on protective relaying and control equipment and practices. Evaluate, report on, and develop standards on other pertinent aspects of protective relaying and control systems not addressed by other PSRC Subcommittees.*

* I SC name and scope approved at PSRC MC meeting 5/12/2022

1. Welcome and guidelines for meeting
2. Recognitions:
   a. Attendee introductions
   b. Thank guests for attending
3. Many thanks to former members of the I-SC:
   a. Joseph Valenzuela
   b. Fred Friend
   c. Zitao Wang
   d. Don Burkart
4. Welcome to new members of the I-SC:
   a. Sudarshan Byreddy
   b. Austin Wade
5. Determine a Quorum (**37 members** total in I SC)
   a. Attendance: __22_____ (min 19 for quorum; YES_X__ or NO ___)
6. Approval of Minutes of the May 10, 2023, meeting
   a. Motion entered by: Michael Higginson
   b. Motion entered by: Hugo Monterrubio
   c. Motion carried unanimously.
7. Coordination & Advisory Committee Meetings Items of Interest
   a. Subcommittee Members' status and incoming Officers for January 2023
   b. Attendee information (approximate): 254 attendees: 153 PSRC, 16 PSCC, 88 Both
   c. Breakfast on Thursday (9/19) morning from 7:00 AM to 8:00 AM before the Main Committee meeting at 7:30 AM.
   d. *Future Meetings – See "Future Meetings" page on PSRC website:*
      - *January 2024 (JTCM) – New Orleans, LA*
      - *May 2024 – Buffalo, NY*
   e. Looking for someone to help our webmaster with the PSRC website
   f. Policies and Procedures for: Power System Relaying and Control Committee Working Group—see PSRC Knowledge Base—review regularly for updates
      - **P&P 2022 version is now available in https://www.pes-psrc.org/knowledgebase!**
      - **PSRC O&P has already been sent out to Main Committee Members for review and comments.**
      - Three officers: Chair, Vice-Chair, and Secretary

IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

IN-PERSON MEETING – Myrtle Beach, SC
Wednesday September 20, 2023, 1:10 PM to 2:35 PM Eastern Time

- All WG Officers must be members of IEEE SA

g. *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.

h. 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.

i. 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.

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

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

l. New "Awards" page on PSRC website—with pictures of recent awards ceremonies.

8. 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
      - See examples provided of 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)

        

        PAR Committee motion_2020-6-18.p
      - Create new PAR for new standard – MC
      - Create new PAR for existing standard without major changes to scope – SC; with changes to scope – MC

IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

IN-PERSON MEETING – Myrtle Beach, SC
Wednesday September 20, 2023, 1:10 PM to 2:35 PM Eastern Time

- 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.

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.

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- WG Chair or WG VC must request certificates directly from the IEEE-SA in myProject. Awards can be shipped to our next PSRC meeting hotel for announcement and distribution or can be shipped to the requestor.

- You will need a list of WG Officers and Members; and shipping address. If shipping to the hotel for the next meeting, send to attn of Awards Chair Andre Uribe, verify the address, and be sure they arrive prior to the Monday of the meeting.

- Awards Ceremony will be at Monday night reception dinner for all PSRC Meetings in May and September. 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.

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. Email WG/TF Rosters to Ritwik Chowdhury at ritwchow@ieee.org with voting and non-voting members listed and marked so they can be incorporated into the updated PSRC membership roster prior to the January meeting.

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9. Working Group Reports – about 1 minute each for non-ongoing groups. What is your status? Are you on track? Do you need help?
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 (**Benton Vandiver**) Claire Patti
I4 (Ongoing)	International Standards Development	**Eric Udren** Normann Fischer
I26	Review and Expand Transaction Paper on Mathematical Models of Current, Voltage, and Coupling Capacitive Voltage Transformers	Mike Meisinger **Steve Turner** Amir Makki
I29	PC37.110 – IEEE Draft Guide for the Application of Current Transformers Used for Protective Relaying Purposes – Revision of C37.110-2007	Joe Valenzuela **Michael Higginson**
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**
I38	PC37.92 - IEEE Draft Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources – Revision of C37.92-2005	Ritwik Chowdhury **Eric Udren**
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

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I41	PC37.90.3 - Standard Electrostatic Discharge Tests for Protective Relays – Revision of IEEE C37.90.3-2001	**Steve Turner** Dan Ransom
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
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	Review and revise: IEEE C37.231-2006 – IEEE Recommended Practice for Microprocessor-Based Protection Equipment Firmware Control	Eric Thibodeau **Nicholas Kraemer**
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**

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I2: Terminology Review

Chair: Mal Swanson
Vice Chair/Secretary: Claire Patti
Output: Terminology recommendations to working groups
Established Date: circa 1995
Expected Completion Date: on-going
Draft: 09-20-23
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 Benton Vandiver, Liaison PSCC at 10:45 am (EDT) on Sept 20, 2023, with Claire Patti, Vice-Chair recording minutes; there were 7 members and 2 guest in attendance. Quorum was achieved.

The minutes from the May 2023 meeting were reviewed with no corrections provided, Matt Black motioned for approval and was seconded by Roger Whittaker with unanimous approval. After one correction to the agenda, Alla Deronja motioned for approval of the agenda, seconded by Yuan Liao with unanimous approval.

Updates were given on each of the assignments. The working group had no new definition reviews at this time. Tony Seegers informed I2 that he will no longer be attending and asked his assignments be reassigned. There are several open assignments pending, Colleen Konsavage picked up the C37.103 assignment and will inform the WG accordingly.

PSCC WG A8 is meeting concurrently with I2 to participate and observe the I2 process. Benton Vandiver is chair and will continue developing A8's processes.

We are looking for volunteers to liaise with the following working groups:
C37.1.2: Data Bases used in Substations.
C37.101: Guide for Generator Ground Protection
2004:WG C33: Recommended Practice for Hardware-in-the-Loop (HIL) Simulation Based Testing of Electric Power Apparatus and Controls
Did not meet in Myrtle Beach. Joint activity with PELS, IAS, and IES.
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.

Any standards work with a PAR (and IEEE Transaction Papers) must be submitted for terminology review and approval of terms prior to balloting. The output from a working group in the form of a report does not need a mandatory review; however, these will be accepted for review and comment upon request to the chair.

Words from approved Standards and Guides with a Section 3 (Definitions) have been incorporated into the IEEE database. An alphabetical listing of the words not in the database, but

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useful to the PSRC is posted on the web site under "TERMS" link under the "Knowledge Base" tab.

The meeting was adjourned at 11:30 am (EDT)

I4: International Standards Development Working Group

Chair: Eric A. Udren
Vice Chair: Normann Fischer
Output: IEC TC 95 USNC standards votes and PSRC status reports
Established Date: 1990
Expected Completion Date: Meetings are continuing.
Assignment: Develop comments and votes for USNC of IEC on TC 95 (Measuring Relays and Protection Systems) standards projects and drafts. Report to PSRC on IEC Standards development.

Attendees: 5 in person
Chair Eric Udren called the meeting to order at 8:00 am EDT on September 19, 2023.
The next TC 95 Plenary Meeting with maintenance team meetings will take place in the Tampa Bay region of Florida February 19-22. The Plenary is on Friday February 22. The Project Team 216-3 on *Digital Interface - Test specification for protection data communication of Line Current Differential Protection* will also meet, likely on February 21.
Standards project business:
95/539/AC – *New TC 95 Chair* – Dr. Murty Yalla retires from Chair of TC 95 in February 2024 after a vigorous and successful 9 year term. The French NC secretariat has proposed Andrea Bonetti (based in SE) as new Chair. Murty reports this is a solid choice. US has agreed and supported Bonetti. Murty will remain with MT4 for coordination and transition.
95/533/AC - Launch of WG3 on *Functional requirements for the protection of direct current (DC) transmission and distribution networks* – USNC is still seeking experts to participate. Normann Fischer is contacting Brian Johnson from the University of Idaho; we're making a broadcast for experts. WG3 is to present a project plan at the January 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.
TR 60255-216-1 – *Guidelines for requirements and tests for protection functions with digital inputs and outputs* – WG2 held a joint coordination Meeting in Lyon, France on May 22-25 with TC 38 (ITs) and some members of TC 57 (control and communications including IEC 61850). There are technical issues in conflict with IEC 61850 standards from TC 57, and TC 57 collaboration issues, to be resolved.
95/541/CD - *60255-27 Ed 3 AMD1 - Safety requirements amendment* – circulated for comments by September 29. Bill Morse of SEL discovered serious inconsistencies that have been injected by editing lapses into tables of creepage and pollution degree related distances among circuits. This drat response is documented in a separate mailing. Please submit additional comments before the September 29 deadline.

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Attendees: Eric Udren (Chair), Murty Yalla, Travis Mooney, Bill Morse, Ilia Voloh
For the next meeting, we need a room for 15 persons with a projector.

I26: Mathematical Models of Current, Voltage, and Coupling Capacitive Voltage Transformers
Chair: Mike Meisinger
Vice Chair: Steve Turner
Secretary: Amir Makki
Output: Report
Established Date: 01/2014
Expected Completion Date: 09/2023
Draft: WG Ballot
Assignment: Recommendation to update and expand mathematical models of instrument transformers and transducers, including interface electronics such as merging units, for use in both off-line and real time transient simulation. There are now new transducer types such as optical, Hall Effect and Rogowski coils in addition to improved models for conventional CTs, VTs and CVTs.

Minutes: The Working Group (WG) did not meet this time because subcommittee ballot will be initiated soon.

I29: Revision of C37.110 Guide for the Application of Current Transformers for Protective Relaying Purposes
Chair: Joseph Valenzuela
Vice Chair: Michael Higginson
Output: IEEE Guide
Established Date: January 2015
Expected Completion Date: December 2022
Draft: D5
Assignment: Revise C37.110-2007 Guide for the Applications of Current Transformers for Protective Relaying Purposes

WG I29 did not meet. C37.110-2023 was approved by RevCom and SASB. It is going through final editorial review and will be published soon.

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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: May 9, 2023
Expected Completion Date: 31-Dec-2023
Draft: 3.2
Assignment: Revise 1613

a) Officer presiding: Brian Mugalian
b) Officer recording minutes: Brian Mugalian
c) Call to order, approximately 8:00 AM Eastern time.
d) Chair's remarks, general welcome
e) Results of call for quorum: 8 of 14 members in attendance for quorum
f) Approval of May minutes: Mike Dood, second Jerry Ramie, passed by unanimous consent.
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 RevCom status; on their calendar for September 19 approval.
k) Working group decided to create a presentation for the May 2024 PSRC/PSCC meeting.
l) Mark Simon will provide a historical article for background for the presentation.
m) The officers will meet over the next 90 to 120 days to create the presentation.
n) A summary paper will be considered at the January meeting.
o) Recess and time of final adjournment, approximately 8:30 am Eastern time.
p) Next meeting date and location will be January 7 – 11 in New Orleans LA.

Meeting Participants:

Name	Affiliation	Voting Status (voting member, non-voting member, guest)
Brian Mugalian	S&C Electric Company	Chair
Mark Simon	Consultant	Voting Member
Lou Garavaglia	G&W Electric	Voting Member
Charles Pestell	Powell	Guest
Adrian Zvarych	Qualus	Guest
Angelo Tempone	Duke Energy	Guest
Mike Dood	SEL	Voting Member
Roger Whitaker	Self	Guest
Michael Meisinger	S&C Electric Company	Voting Member
Hani Al-Yousef	Eaton Corporation	Voting Member
Gerald Ramie	ARC Technical Resources	Vice-Chair
Thomas Rudolph	Schneider Electric GmbH	Voting Member

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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

1. Introductions were held
2. We had 5 members attend the meeting
3. No meeting minutes to review
4. We've reviewed the survey results, qualified the participants, and cleaned up the data
5. We plan on meeting next session to begin the report
6. Next meeting: New Orleans, LA
7. Adjournment at 10:30 am

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.

a) Officer presiding-Scott Cooper
b) Officer recording minutes-Scott Cooper
c) Call to order- 23/09/19 10:40 PDT
d) Chair's remarks- Current membership, Review of project status, way forward.
e) Results of call for quorum: 1/4 members present, 5 guests
f) Approval of Agenda (motion and second)-NA
g) Approval of Minutes of previous meetings (motion and second)-NA
h) Summary of discussions and conclusions including any motions
i) Action items:
    a. Resolve comments and update the report
    b. Resubmit to I-subcommittee for next action
j) Items reported out of executive session (if such sessions have occurred)-NA
k) Recesses and time of final adjournment (if different from our published face-to-face meeting agenda) 23/09/19 11:30 CDT
l) Next meeting date and location, January 2024 or WebEx as required

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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
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
Hani Al-Yousef	Eaton	Voting Member
Travis Mooney	SEL	Voting Member
Roger Whittaker	Self	Guest
April Underwood	SCS	Voting Member
Malia Zaman	IEEE SA	Guest

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Lamar Phillips	Westinghouse	Guest
Alex Kobylansk	ABB	Guest

- Officer presiding: Bill Morse
- Officer recording minutes: April Underwood
- Call to order, approximately 1:00 pm
- General welcome
- The meeting had 4 Voting members. Quorum was not met.
- May 2023 Meeting Minutes need to be approved via email.
- Patent slides were shown, no claims were made. Copyright and Participant behavior slides were shown, no claims were made.
- Discussions:
- The group went through and worked on giving definitions to the IEEE undefined category.
- Action Items:
- Follow up meeting to finish reviewing the undefined definitions presented.
- Revisions will be included on a new copy of the standard draft and definitions section will be updated.
- Team will review draft and make a motion to go to ballot via email.
- Provide Member list to IEEE SA
- Final adjournment, approximately 2:10 pm EDT.

I38: IEEE Standard C37.92 Standard for Analog Inputs to Protective Relays from Electronic Voltage and Current Transducers
Chair: Ritwik Chowdhury
Vice Chair: Eric A. Udren
Output: Standard
Established Date: January 2019
Expected Completion Date: May 2023
Draft: 5.2
Assignment: To revise and update C37.92

WG I38 did not meet. WG has disbanded.

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

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Established Date: September 2018
Expected Completion date: Dec 31, 2024
Draft: 6
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, September 19 in a single session beginning at 2:20pm Eastern daylight time. This was an in person meeting. There were 11 people in attendance. A quorum was achieved with 7 of 12 voting members in attendance.

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 Travis Mooney to approve agenda. The motion was seconded by Toney Bell. Agenda was approved.

Minutes from the May 2023 meeting were reviewed. The motion was made Travis Mooney to approve minutes. The motion was seconded by Lou Garavaglia. Meeting minutes were approved.

Results on electronic vote to send standard to ballot group was discussed. The tally was 10 of 12 voting members returned a vote with 100% approval to go to ballot. Six of the voters included comments with their approval vote. All comments were addressed and discussed during the meeting.

Roger anticipates sending standard to ballot following the I subcomittee meeting.

This completed the meeting. Bill Morse made the motion to adjourn the meeting. Tony Bell seconded the motion. The meeting was adjourned.

I41: Draft Standard for Electrostatic Discharge Tests for Protective Relays

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

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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.

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 9:20 ET on Wednesday September 20th, 2023 in a Hybrid format.

a) Introductions

b) The chair, vice-chair, and secretary introduced themselves. The meeting opened with 11 members and 7 in-person/virtual guests.

c) Quorum verification: A quorum was not obtained at the beginning of the meeting, since less than 11 members were not always present (scheduling conflicts). The January, May, and September meeting minutes could not be approved without a quorum. However, they will be approved electronically later.

d) The WG leadership proposed that the format of the report be modified in interest of time and value to the end user. This proposal will be sent to the Voting Members later for approval.

e) Mr. Travis Mooney from SEL gave a presentation regarding the IEC standards that are related to the HEMP understanding, testing, and possible mitigation strategies. Productive discussions took place related to the values that some studies have shown to be useful representations of the effects of HEMP into the equipment and structures were these devices are contained.

f) The leadership of the WG will continue hosting the by-weekly calls for developing the document with hopes of completing this work in the coming months. Some existing members will reach out to additional contributors and new guests showed interest in participating on this report.

The meeting was adjourned at 10:30 ET.

Our next meeting will be in New Orleans, LA in January of 2024 (time TBD). A room for 30 people will be needed.

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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.

1. Introductions
2. We had 7 members attend the meeting
3. Review of May 2023 meeting minutes
   a) *We reviewed the report and determined that the report needs some modification so that it addresses the type of skill sets needed for a protection engineer or technician to properly perform work in a digital substation vs addressing the various skill sets needed per individual function i.e., protection, networking, commissioning, etc…*
      a. *A modified report will be issued, and several volunteers have been assigned to peer review.*
      b. *WG goal is to have a final draft completed during September's meeting.*
   b) *Members determined that we are at final draft.*
   c) *Members agreed to review report for final edits or comments.*
   d) *Members agreed to a virtual meeting for July 16th to continue finalizing the report.*
   e) *Members goal is to submit our final paper during September's meeting.*
4. Review, discuss, and finalize the remaining comments from our members.
5. Members agreed to submit for approval to the I-Subcommittee.
6. Next meeting location: New Orleans, LA
7. Adjournment at 4:40 pm

I45: Report on Grounding of Instrumentation and Control Circuits

Chair: Adrian Zvarych
Vice Chair/Secretary: Jalal Gohari
Output: Report on Grounding and Bonding of Instrumentation and Control Circuits
Established: May 2020
Expected Completion date: 2023
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 – by Adrian Zvarych 1:00 PM Eastern
- Check for quorum – 9 members present, 5 guests

IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

IN-PERSON MEETING – Myrtle Beach, SC
Wednesday September 20, 2023, 1:10 PM to 2:35 PM Eastern Time

Display the following:

- IEEE Patent Policy: Call for Patents: https://development.standards.ieee.org/myproject/Public/mytools/mob/slideset.pdf
- IEEE Copyright Policy: https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/copyright-policy-WG-meetings.potx
- Show Respect For Others

Proposed Agenda

- Review-Approve Last Meeting Notes - 1st Ware 2nd Gohari
- Approve Proposed Agenda 1st Ware 2nd Gohari
- Continue the Report review starting within Section 4.10 (Page 42)
- @ 5 minute mark – Round Table & Action Items
- Identify Outstanding Contribution Items…
- Adjournment - @ time

Meeting Accomplishments & Action Items:

- Review Report starting @ Section 4.11
- Next I45 Meeting
  Wednesday 11 October 2023 - Teams
  11:30 AM – 12:30 PM Eastern Time

I46: Guide for Grounding of Instrument Transformer Secondary Circuits and Cases
Chair: Bruce Magruder
Vice Chair: Sudarshan Byreddy
Virtual Meeting/Teams: 20 September 2023, 8:00 – 9:10 AM EST
Output: Revise IEEE C57.13.3-2014
Established Date: September 2021
Expected Completion Date: December 2026
Draft:

a) Call to order – Sudarshan, 8:00 AM EST
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) As quorum was not achieved

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

Brian Mugalian will review Section 4 –Assignment pending
Jim O'brien will review section 5.1 through 5.4 – Received.

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Bruce Magruder will review section 5.5 & 5.6 – Received.
Sudarshan Byreddy & Bruce will review section 5.7 - Received
Shivam Prabhakar will review section 6 – Assignment pending
Jim Niemira will review section 7 - Received
Sudarshan Byreddy will write a new section 5.7.3.5 - Pending
Jim Niemira will review Annex A - Received
Brian Mugalian will review Annex B - Assignment pending
Bruce Magruder will review Annex C- Assignment pending

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.

Name	**Affiliation**	**Voting Status (voting members)**
Bruce Magruder	SOLV Energy	Chair – Voting Member
Sudarshan	Burns & McDonnell	Vice Chair - Voting Member
Randy Roberts	Southern Co	Guest
Steve Conrad	Retired	Guest
Jorge A. Cintron Rivera	US NRC	Guest
Ritwik Chowdhury	SEL	Guest
Matt Black	Sargent & Lundy	Guest/ Terminology Liaison

IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

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I47: Revise IEEE C37.231-2006 - IEEE Recommended Practice for Microprocessor-Based Protection Equipment Firmware Control.

Chair: vacant
S18 Co-Chair: Eric Thibodeau
Vice Chair: Nicholas Kraemer
Secretary: vacant
Output: Revision of an Existing Standard
Established Date: September, 2021
Expected Completion Date: December, 2025
Draft: N/A
Assignment: Revise the Standard. The revisions include clarification on the use of the Standard and on the impact of the latest NERC CIP and PRC requirements.

Presiding officer: Nicholas Kraemer
Minutes recorded by: Eric Thibodeau

Meeting was called to order. Pre-PAR patent, copyright, and participant behavior information were shown and discussed; no objections were raised. Quorum was not achieved with 5 of 10 members. This was an informational meeting only

Main discussions and proceedings:

- Don Burkhart and Amir Makki respectively stepped down as I47 chair and secretary shortly before the meeting
- Synergy between PSRC (lead committee) and PSCC (supporting) was discussed at the meeting. We still need to reach out to PSCC S0 to get involvement on their part. To gather more interest, meeting should be listed as joint on the next agenda
- PAR as approved by PSRC I will be submitted as soon as possible. PSCC approval is not required per their P&P. Eric and Nicholas will be reaching out to Standards coordinators to see if they can submit themselves or if we need to wait for a new chair to be appointed
- Milton Quintenos expressed interest to become the I47 co-chair of the WG. Charles Pestell expressed interest to take up the secretary role

For next meeting, we will need room for 25, with projector. Avoid conflicts with P13, P15, S16 and S17. If possible, schedule in one of the PSCC rooms to have access to teleconference setup

IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

IN-PERSON MEETING – Myrtle Beach, SC
Wednesday September 20, 2023, 1:10 PM to 2:35 PM Eastern Time

I48: Revision to IEEE C37.103: Guide for Differential and Polarizing Relay Circuit Testing and Polarizing Relay Circuit Testing
Chair: Mohit Sharma
Vice Chair: Gary Kobet
Secretary: Open
Output: IEEE Guide
Established Date: January 2023
Assignment: Revise IEEE Std C37.103 - Guide for Differential and Polarizing Relay Circuit Testing

I-48 met session on Sept 20th, 2023, at 8 AM EDT with 2 attendees.

Since no members were present, we couldn't make any progress. Ritwik and Mohit discussed the gameplan of future steps about balloting and submission timelines.

The meeting was adjourned early because of no attendance at 8:35 AM EDT.

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.

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/.

IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

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11. Old Business

a. Still looking for liaison for the following committees:
   i. Power System Instrumentation and Measurements (PSIM) Committee, including the Sensors Subcommittee.
   ii. Transformers Committee, including Instrument Transformer Subcommittee—Will Knapek is retiring.

   If you would like to be the liaison, please email Ritwik Chowdhury at ritwchow@ieee.org.

b. WG I41 completed their assignment. IEEE Std C37.90.3-2023 IEEE Standard for Electrostatic Discharge Tests for Protective Relays was approved by the IEEE-SA Standards Board on June 29, 2023, and the standard published on September 5, 2023.

c. WG I31 completed balloting and received RevCom approval for publication of IEEE Std 1613-2023 Standard for Environmental and Testing Requirements for Devices with Communications Functions used with Electric Power Apparatus. After editorial work, this standard will be published. Congratulations!

d. WG I26 “Mathematical Model for Current, Voltage, and Capacitively Coupled Voltage Transformers” I-SC Ballot results.
   Note—The total number of I-SC members was 39 when the ballot took place:
   i. Ballot initiated on May 23, 2023, with a due date of June 20, 2023. Took several extensions to meet the response rate requirements.
   ii. 35 out of 39 I-SC members (90%) responded to the ballot—28 Approved + 3 Approved with Comments (79.5%), 2 Abstained, 2 Disapproved.
   iii. Met 75% approval from the subcommittee, which is 30 I-SC members. WG is resolving all outstanding comments.
   iv. All comments were subsequently resolved by WG I26.
   v. Recirculation initiated on August 25, 2023, with a due date of September 12, 2023.
   vi. Two votes changed—one from approved with comments to approve and another from no response to approved. Overall 36 out of 39 I-SC members (92%) responded through the ballot—30 Approved + 2 Approved with Comments (82%), 2 Abstained, 2 Disapproved.
   vii. Submitted to PSRC Officers for final review and approval. Initiated on September 13, 2023, with a due date of October 16, 2023.

IEEE PES PSRC – I Subcommittee – Protection and Control Practices Agenda

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12. New Business

a. MOTION requesting a PAR Extension for Working Group I36 assigned to PC37.90.2 – one year for recirculation and approval.

Motion by: Chase Lockhart Second by: Don Ware

Motion carried unanimously.

b. MOTION requesting IEEE-SA Ballot initiation for Working Group I40 using PC37.90.1 Draft 8.

Motion by: Roger Whittaker Second by: Will Knapek

Motion carried unanimously.

c. MOTION requesting disbandment of Working Group I38 considering publication of *IEEE Std C37.92-2023 Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources* on 25 April 2023.

Motion by: Eric Udren Second by: Hugo Monterrubio

Motion carried unanimously.

d. MOTION requesting formation of Working Group I50 to create a summary paper of the recently published *IEEE Std C37.92-2023 Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources*.

Motion by: Eric Udren Second by: Andre Uribe

Motion carried unanimously.

Note—Eric Udren to serve as the chair.

e. MOTION requesting disbandment of Working Group I29 considering publication of *IEEE Std C37.110-2023 IEEE Guide for the Application of Current Transformers Used for Protective Relaying Purposes* on 24 May 2023.

Motion by: Michael Higginson Second by: Don Ware

Motion carried unanimously.

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f. MOTION requesting formation of Task Force ITF51 to determine need and interest of a summary paper for the recently published *IEEE Std C37.110-2023 IEEE Guide for the Application of Current Transformers Used for Protective Relaying Purposes*.

Motion by: Michael Higginson Second by: Andre Uribe

Motion carried unanimously.

g. P0079 submitted for NesCom review and approval with CAG as the lead and PSRC/I-SC as the co-standards committee. **Need new liaison/standards committee representative (SCR)**. If you would like to be the liaison, please email Ritwik Chowdhury at ritwchow@ieee.org.

h. Other new business?

13. Liaison Reports

a. Instrument Transformer Subcommittee – Will Knapek
Nothing to report. This was Will's last meeting as the liaison.
b. PSRC China Satellite I-SC Liaison, Shenxing Shi?

14. Motion to Adjourn, by Don Ware, second by Adrian Zvarych
Adjourn time: 2:28 pm

Next meeting in New Orleans, LA, January 2024.

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

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

IN-PERSON MEETING – Myrtle Beach, SC
Wednesday September 20, 2023, 1:10 PM to 2:35 PM Eastern Time

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)

Additional notes:

a) Be diligent to keep the standard header information up to date.
b) Expected completion date gives anyone a reasonable idea of where you stand in your work – without having to seek out another document such as the excel spreadsheet listing what rev you are on.
c) **Do not include meeting room requests and conflict avoidance requests in your minutes**.
d) Do not use significant paragraph indents.
e) Keep multilevel numbered lists to no more than two levels if possible.
f) If this is PAR related activity, include the SA document number in the Title of the Working Group.

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

IN-PERSON MEETING – Myrtle Beach, SC
Wednesday September 20, 2023, 1:10 PM to 2:35 PM Eastern Time

Proposal for New TF or WG

Date:

Definition of the Problem

What is happening?

What should be happening?

Proposal for Task Force

Submitted by:

J Subcommittee Meeting Minutes, September, 2023, Myrtle Beach, SC

J SC met Wednesday September 20, 2023 at 2:45 PM EDT with 21 out of 31 members and 17 guests, reaching quorum.
A motion to approve the September 2023 J SC agenda was made by Russ Patterson and seconded by Gene Henneberg. The agenda was approved unanimously.
A motion to approve the May 2023 J SC meeting minutes was made by Jason Eruneo and seconded by Steve Conrad. 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 13)
Status: 26th Meeting (9-19-23)

Assignment:

1. Review, compare, and contrast NEMA MG-1 with ANSI C50.41 regarding transfer criteria.
2. Examine published reports and papers on motor bus transfer criteria to compare the conclusions with NEMA MG-1 with ANSI C50.41 regarding fast transfer criteria.
3. Investigate existing open-transition motor bus transfer (MBT) actual data from multiple events at the medium voltage level. Examine for current and torque ratio versus Volts/Hz at transfer periods to see if there is a correlation.
4. Examine published reports, papers, C50.41 and NEMA MG-1 on motor fast bus transfer criteria to reconcile the conclusions with the field-measured results.
5. Study existing motor protection oscillography voltage and current to identify which motors are generating and which are motoring. Examine v/Hz of composite bus and individual motors, and individual motor reacceleration current versus total bus reacceleration current (if available).
6. Produce a Report to Subcommittee with findings of the above

WG Report

1. The Working Group (WG) met on Sept 19, 2023 in Myrtle Beach, SC.
2. Attendance: Total 15 (11 members and 4 guests).
3. Quorum was not achieved so minutes from prior 4 meetings were not approved.
4. Wayne added drop down sorting/filtering capability to the columns of the WG ballot commenting tracking spreadsheet.
5. As there were numerous comments submitted, Wayne mentioned that we will form some editorial and technical ad-hoc groups to meet separately between in-person meetings via Teams to go through and work on resolving all the comments.
6. The **editorial** group will consist of the following members: Wayne Hartmann, Doug Weisz, Tom Beckwith, JC Theron, and Bracy Nesbit.
7. The **technical** group to resolve comments on “Modeling A” sections will consist of the following members: Tom Beckwith, Wayne Hartmann, Doug Weisz, Dale Finney, Jason Eruneo, and Bracy Nesbit.

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8. The **technical** group to resolve comments on "Modeling B" sections will consist of the following members: Dale Finney, Wayne Hartmann, Doug Weisz, Jason Eruneo, and JC Theron.
9. The meeting was adjourned (Jason made the motion and Bracy seconded).

Next Meeting:
Single session, projector, room for 30 people. 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: 18th Meeting (9-18-23)
PAR Expiration: Dec 2024

Assignment: Revise C37.101 Guide for Generator Ground Protection

WG Report

The WG met with 35 total participants of which 20 were guests and 15 were members including 3 new members: David Reese, Laurel Brandt, and Sunil Kabra. 32 participants were in-person while 3 attended remotely.

Quorum was not achieved so the Vegas, May 2023 meeting minutes were not approved.

Ryan reviewed the patent slides required for IEEE PAR WGs and he mentioned that the PAR ends 12-31-2024 so we will likely be requesting a PAR extension early next year.

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.

A recent ground fault event analysis was presented by Daren Phelps where severe equipment damage was experienced. Some of the discussion points included to consider adding third harmonic protection elements as triggers for any accelerated protection schemes or intermittent ground fault protection schemes. Ryan volunteered to draw up some language to include any elements that can detect a ground fault as initiate inputs to any of the accelerated or intermittent schemes. Partial Discharge Detectors were also discussed and the advantages of having this type of monitoring in place may have also saved some damage for this event.

Doug will lead the review of the Annexes and will schedule and hold Teams meetings prior to the next in-person meeting. If the new members Laurel, Sunil, and David can review the annexes

J Subcommittee Meeting Minutes, September, 2023, Myrtle Beach, SC

along with Bracy and Joshua who volunteered during the last meeting in Vegas, we should be prepared to start discussing and resolving annex comments.

In addition, Ryan will hold interim meetings prior to the next in-person meeting to continue discussing and resolving some of the over 300 comments that have already been submitted.

Next, the group discussed and reviewed some of the comments where several were resolved via group consensus:

- Comment 70: Section 5.2 was titled “Traditional Neutral Overvoltage Protection Scheme” and it was proposed to change this to “Fundamental Frequency Ground Overvoltage Protection” or “Fundamental Frequency Ground Overvoltage Protective Function”.
- Comments 45-48: Section 4.2.1 was discussed where Ryan proposed some overall new language to satisfy all comments.
- The noted 2.5 times factor listed for the transient overvoltage was questioned by Doug as here recalled either in the Reimert book or C62.92 that the factor is 2.6 instead. Doug will research and provide feedback.
- There was some discussion on the typical low resistance available ground fault current being changed from 400A-1200A to 200A-400A. Ashrafi mentioned that the higher range may be more representative. Doug responded that typically for generator grounding that the 400A is the max he has seen, but certainly for MV switchgear the higher value is certainly more common. Doug mentioned that this guide is for generator ground protection so the 400A may be fine, but Ashrafi questioned whether this is meant for other circuit grounding as well as the section titles do not specifically denoted the grounding method is only for generator grounding. We discussed whether to add “generator” to all the grounding method section headings or if that is even needed as the entire guide is specific to generator ground protection.
- Comments 49-51: Section 4.2.2 on hybrid grounding was discussed. Whether to denote this as high resistance or high impedance and low resistance or low impedance was a point of some discussion and if separate sections on low and high reactance grounding should be included. Wayne volunteered to take a look at this section and see if he can come up with some language that is more inclusive, etc.
- Comment 67: Section 5.1 and others, Gary suggested adding figures for each section as a quick visual representation of the application. Doug questioned whether the noted “phase-to-neutral” voltages should instead be listed as “phase-to-ground” voltages to be more technically correct as the neutral shift during a ground fault on a high-impedance grounded system means “n” is not equal to “g” so 2 of the phases will have the phase-ground voltage = 1.732 times the phase-neutral voltage.
- Comment 84: Section 5.2, Will suggested some clarifying language as to when and why the secondary VT fuses should be coordinated with 59N (i.e. 59G, 64G1, etc.). Doug volunteered to also add a description as to how the zero-sequence path is broken e.g. moving the VT secondary ground reference from the common point to one of the phases for (3) Yg/Yg VTs.
- Comments 92, 93, 96: Section 5.2, addressed Ritwik’s comments on parallel generator applications where we referred to some of the language in reference 11 in which Ritwik

gave some more detailed information on this topic. Also, section 5.13.4.1 on staggered tripping selectivity provided discussion points and Ritwik said he can re-review some of this overall language to see if some more description text can be proposed.

- Comment 102: Section 5.2 in which Gary had some comments on the NGT secondary fuses language. At a prior meeting this topic was presented and discussed in detail where consensus was that it may not be a good idea to have fuses in the NGT secondary. And certainly a fused in series with the NGR would not be a good idea so some language was proposed and discussed to make this section clearer.
- Comment 104: page 17, 3rd harmonic to detect fuse loss in the NGT secondary circuit was discussed although if the fuse blows, then the VN 3rd value will decrease and trip the third harmonic undervoltage element so it may be difficult to distinguish between a fuse loss and an actual event, unless the application is just alarming with the undervoltage element although for a true fault, one would think a trip would be preferrable.
- Comment 107: Initiate acceleration schemes with all ground elements i.e. not only the base 95% element but also the 27TH, 59THD, 64S (although that may already be very quick), etc.

Motion to adjourn was made by Bracy and seconded by Nader.

Next Meeting:
Double session, room for 30 people and a projector. The WG also request no conflict with other J meetings, especially J17 (C37.102). Prefer to meet on Tuesday or Wednesday.

J17: <u>Revision of C37.102 Guide for AC Generator Protection</u>
Chair: Manish Das
Vice Chair: Gary Kobet
Output: IEEE Guide
Draft: 7.6
Established: May 2017
Status: 23rd meeting, September 18, 2023 (In Person)
Expected completion date: -
PAR Expiration: Dec 2024

Assignment: Revise C37.102 Guide for AC Generator Protection

WG Report

WG met on Sep 18, 2023 in person for a single session with attendance recorded from a total of 13 members and 21 guests. Quorum was not met. The May 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 7.6 is in recirculation SA ballot (9/8 - 9/29), and thanked all WG and CRG members that have helped with resolving the initial SA ballot comments and those who have taken the time to review and approve the latest draft.

A few “late” comments on draft 7.6 were discussed as follows. Given the timing of these comments that were brought up after initiation of recirculation ballot, and in order to avoid

opening up any potential changes now to new comments possibly requiring additional rounds of recirculation ballots, it was discussed that any “improvement” type comments (vs a mistake that must be corrected) may be left to a future revision. The Chair also mentioned that most of these specific items were discussed in the WG at some point in the past.

- Page 11, Line 9 (Subclause 3.4.2): For clarity, consider dropping “Unit” from subclause title. “Unit generator-transformer” is typically used only when the 52G breaker is on the high side of GSU. Subclause 3.4.2 is describing an arrangement where 52G is on the low side of GSU.
- Page 11, Line 11 (Subclause 3.4.2): Suggest revising “all sized”, with “typical” or “various” or something similar.
- Page 44, Line 19 & Page 45, Line 33 (Subclause 4.3.3.1.1): Consider clarifying “all operating regions” in reference to the survey of third harmonic voltages. One alternative discussed to replace it with was, “entire range of expected operating regions”.
- Figure 38 - Injection scheme for generator ground fault protection
  - Consider showing the filter element only in one place vs the two presently shown.
  - Add a resistor to the filter element, or remove any RLC entirely and just say “coupling filter”.
  - Consider replacing “coupling filter” with “band pass filter”.
  - Consider changing the “non-fundamental frequency voltage injector” block to show a square wave signal instead of a sinusoidal signal, which typically represents fundamental frequency.
- Page 163, Line 32 – Annex A 64S: Present verbiage seems to discuss the calculation of insulation impedance only. Consider adding a brief example calculation for overcurrent based 64S protection employed by some relays. Doug Weisz can provide some material.

In addition, the Chair mentioned that another WG member, who is also a SA balloter, is reviewing the material related with an original SA ballot comment on Figure 56 Rotor Harmonic Heating and will likely suggest a correction(s).

Any changes resulting from the ongoing recirculation ballot, along with any from the above discussion, will be incorporated into a redline of draft 7.6 which will be sent to WG to review prior to initiation of a 2nd recirculation ballot, as required.

Present CRGs will be retained to help address and disposition any further recirculation ballot comments.

Next Meeting:
Request a single session with space for 40 people and a computer projector. The WG also requests no conflict with all J, especially J16 (C37.101).

J19: <u>Revision of C37.106, Guide for Abnormal Frequency Protection for Power Generating Units</u>
Chair: Ritwik Chowdhury
Vice Chair: Jason Eruneo
Output: Guide

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Established: January 2019
Status: Guide approved 16 June 2022, published 2023

In the J Subcommittee meeting the following motion was made by Ritwik Chowdhury, and seconded by Mike Thompson. The motion was approved unanimously.
Motion: Working Group J19 motions to disband the J19 working group.

J20: <u>Report on Practices for Generator Synchronizing Systems</u>
CHAIR: Jason Eruneo
VICE-CHAIR: Ritwik Chowdhury
Output: Report (Draft 9.2)
Established: January 2019
Status: 13th WG Meeting, Myrtle Beach, SC September 19, 2023

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

Working group started the meeting with comments resolution from the recirculation ballot.

- Will's comment is addressed with modification to Figure 8 and its caption.
- Several other comments were addressed.
- **Action Item: Ritwik and Jason** will carefully (so nothing is lost) merge the autosynchronizer tuning section to 3.1.5.1.

Some editorial comments will be addressed offline. Overall, all comments were addressed.

Working group discussed creating additional examples in the appendix. The appendix would have three examples worked out with the existing example left in there.

- A second example with a high-voltage breaker application.
- A third example with a simple synchronism-check relay with a time delay and how to coordinate it with the autosynchronizer.
- Considerations where the transmission owner and generator owner are not the same company.
- Review operating procedures to see how the unit is normally synchronized and ensure that the new relays will work with the procedures.

The working group agreed not to use time-delays for the synchronism-check relay because that impacts the synchronization performance.

The working group concluded that the examples may take longer, considering possible additional discussion. These can be done in a later PAR activity, e.g., a Synchronizing Guide. Therefore, we can proceed to subcommittee ballot.

Next meeting:
Single session. With room for 30 and a projector. Request no conflict with C45, I38, J17, J25, K31.

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J21: Motor Protection Tutorial
CHAIR: Derrick Haas
VICE-CHAIR: JC Theron
Assignment – Develop a practical motor protection tutorial based around IEEE C37.96. The intent is to aid the reader to develop effective relay settings.
Output: Tutorial
Established: September 2019
Status: WG (13th meeting September 20, 2023 Myrtle Beach, SC)

WG report

The WG met with 4 members, 9 guests, and quorum was not met. 13 attendees.

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

May's meeting minutes will be approved via email.

No change to the plan of attack to proceed with writing and presentation assignments, and continue to coordinate with J22 activities for any major changes to the guide.

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

Available outline was not the latest and not available in share, hence the latest outline must be shared (to all members and guests) to be in line with below assignments.

1,2 – Derrick Haas
4 – JC Theron & Dale Finney
7 – Tom Beckwith
5b – Will English
8 – Shashidhan Sathu
11 – Gary Stoedter
9 – Bracy Nesbit
3 – Bracy Nesbit & Dale Finney
6 – Derrick Haas (including broken bar)
5a – JC Theron
10 – Derrick Haas
12 – Deleted section

Clarification that assignment includes both written document and presentation slides.

Synchronous motor data sheets reviewed:
1 – 30,000 hp
2 – 14,000 hp

Examples to be distributed to J21/J22 WG's for examination and selection.

Motion to adjourn (Zeeky, 2nd Tom)

Action Items:
- Dale Finney and JC Theron took an action item to review the existing material related to thermal element/model in the guide and determine if we needed to add a dedicated section

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or not. One meeting took place. Outline is in progress; references obtained and being reviewed. This is in progress and planned to be completed by January meeting.
- Derrick Haas took an action item review example Induction Motor in Annex A with Dale Finney, who was assigned to review Annex A for J22.
- Gary K to obtain PSRC template for slides. Update – slides sent to chair on May 15, 2023.
- Derrick to send out assignments, word document template, power point template.
- Derrick and Zeeky to distribute motor data sheets.

Next meeting:
A single session is requested with room for 30 and a projector. Also request no conflict with J, especially J22. Schedule J21 to immediately follow J22.

J22: <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 10
Expected Completion Date: May, 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 tenth meeting on Wednesday, September 20th, 2023 in a double session with 8 members and 13 guests in attendance.

I. Welcome/Introduction
   a. The Chair kicked off the first session at 8:05am EDT and welcomed members and guests, this was followed by introductions.
II. Quorum check
   a. 8 of 27 members were in attendance. Quorum was not met.
III. Approval of Meeting Minutes. Quorum not having been met, Chair will seek approval of January & May 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. Shared two sample motor data sheets provided by Gary Kobet. Data sheets are available in iMeetCentral for consideration for future use. They were also provided to J21 (Synchronous Motor Tutorial). Bracy asked if there were copyright issues with including/using the data sheets since one of them identified a manufacturer. We will not include name of the manufacturer when we do this to get around that issue. Chair will investigate regarding the copyright question.
   b. Jason Eruneo comments. Reviewed comments Sections 5.2.8 (7th paragraph) – 5.2.11.2. Key points:

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i. 5.2.8
- Need more discussion on how to apply distance protection to supervise 51 (START) during motor start. (Nallan Kumar and Tom Farr)
- Add undervoltage supervision to clause on overvoltage supervision method of supervising 51 (START). Section C, changing “element” to “Function” to keep consistent nomenclature.
- Will add voltage-time plots to illustrate use of the functions.

ii. 5.2.10.2 - Will add “protector” to Definitions.
iii. 5.2.11.1 - Last paragraph to be reworded to state that care should be taken to prevent multiple motor starts. (Tom Farr).

VI. Other Business,
a. New members:
i. Yuan Liao – I2 (Terminology Guide) Chair
ii. Tom Farr – member of previous working group
b. Tom Beckwith pointed out that the guide could use a stronger discussion on transferring busses with synchronous motors. Tom Farr agreed to review and draft additional language.

VII. Next Steps.
a. Discussed status of assignments
i. Chair will update status of summary spreadsheet currently available in iMeetCentral.
ii. There is a backlog of material for review pending from 2022. Chair and Vice- Chair will determine a strategy to clear the backlog. Tom Beckwith suggested assigning focused reviewer groups to review and report back to the working group.
b. Chair reminded working group to complete assignments and upload output to iMeetCentral.
c. Next meetings
i. November TBD, 2023, Virtual Meeting
ii. January 7th-11th, 2024, New Orleans, LA.

VIII. Adjournment. Meeting Adjourned after the second session at 10:30 am EDT. (Bracy Motioned to adjourn and JC Theron Seconded)

Next meeting:
Single session with accommodations for 30 people and a projector is requested. Also request no conflict with J15, J21, J25, and JTF28. Also request no conflict with J16, J17, J20, J26, J27 and K31 if possible. Schedule J22 to immediately precede J21.

J23: <u>Report on Generator Condition Monitoring</u>
Chair: Steve Turner
Vice Chair: Rob Messel
Secretary: Open
Output: Report
Established Date: May 2021
Status: (9-19-23)
Expected Completion Date: Open
Draft:
Assignment:
Develop a report that covers the following aspects of condition-based monitoring for synchronous machines:
- Describe and develop guidelines for online condition monitoring of large synchronous machines, including salient-pole rotors as well as cylindrical rotors.

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- Use online machine condition-based monitoring to detect potential problems before an actual fault develops and schedule maintenance.
- Provides information on online condition monitoring techniques as well as proposing typical thresholds to trigger alarms and initiate remedial or compensating action.
- Demonstrate how to use specific the protection functions to monitor machines.
- Describe mechanisms of degradation and applicable monitoring devices.
- Some relays can monitor RTDs and other transducer-based signals. Some relays monitor field voltage and current. Some relays also include thermal models for the stator and rotor.
- Pilot projects to explore this technology.
- Work with other technical committees as necessary.

WG report

Writing assignments have been received from the following working group members:

1. Laurel Brandt - 64F load profiling (can be combined with Steve Turner's assignment)
2. Sungsoo Kim – spilt phase differential protection
3. Ellery Blood - mechanisms of degradation and applicable monitoring devices
4. Steve Turner – 64F condition monitoring
5. Dale Finney – pilot project
6. Dale Finney & Bracy Nesbit (coauthors) - condition-based monitoring to detect potential problems before an actual fault develops and schedule maintenance

<u>Outstanding Assignments</u>

1. 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

2. Provide information on online condition monitoring techniques as well as recommending thresholds to trigger alarms and initiate remedial or compensating action.

Steve Turner – APS >	Provide draft for review at next working group meeting
Jay Mearns – PGE >	**Outstanding**
Abel Gonzales – Megger >	Provide draft for review at next working group meeting

3. Demonstrate how to use specific the protection functions to monitor generators.

Steve Turner – APS >	Provide draft for review at next working group meeting
Steve Turner & Doug Weisz >	64S commissioning and setting; outstanding
Doug Weisz – Hubbell >	Load Profiling/Commissioning/Injection; outstanding
JC Theron – GE >	**Outstanding**

4. Results from a study on partial discharge conducted on 107 machines.

Jay Mearns - PGE >	**Outstanding**

Next meeting:
Single session with accommodations for 20 people is requested.

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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 09/16/2023 at 3:40pm EDT with 4 people in attendance, 2 members and 2 guests. 2 out of 5 voting members present, quorum was not met.

Proposed agenda and minutes from May meeting were reviewed and will be approved via email. Participant behavior, patent, copyright, and WG assignment were reviewed with no comments.

The assignment “Generator Signals to be monitored during transient events” was reviewed and discussed in detail. The need to review requirements Ercot 255 and Nogrr 255 was highlighted, and any additional needed info will be included in the assignment.

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.

Derrick Haas wasn’t present, hence the need to reach out to the Chair of J18 to determine if their work regarding effects of SSO due to IBR on rotating machinery protection and control could be of some relevance to the J24 report still to be reviewed. The group feels that the monitoring required to detect SSO could be included in the report. J23 condition monitoring may also be of interest and was discussed with J23 chair offline.

WG files and resources uploaded to ShareFile folder (https://psrc.sharefile.com/home/shared/fo6be30c-453a-4e15-a84c-500b1c1cf436). Meeting adjourned, motioned by Laurel Brandt and seconded by JC Theron.

Next meeting:
Single session with accommodations for 10 people is requested.
Please avoid conflicts with H46, H52, PSCC S15 and all J, particularly J21.

J25: Report on Synchronous Condenser Protection
Chair: Jason Eruneo
Vice Chair: Dale Finney
Secretary: open
Output: Report
Established Date: September 23, 2021

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Status: 6th WG Meeting, Myrtle Beach, SC September 20, 2023
Expected Completion Date: January, 2025
Draft: 3.0

- **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 26 attendees. There was a check for quorum and a quorum was not established.

At the general meeting, PSRC members communicated to Electric Machinery Committee that we had concluded a synchronous condenser could not slip a pole. Several members of the EMC strongly disputed this conclusion. There will be a joint meeting between J25 and EMC on September 29 where Normann Fischer will make the same presentation he made to J25 which convinced us out of step protection was not needed.

The Chair gave a presentation on loss of field schemes applied to synchronous condensers. The starting point of a synchronous condenser in the R-X plane starts far to the left R plane, either 2nd quadrant (providing MVAR) or 3rd quadrant (absorbing MVAR). One WG member stated they have performed simulations and on loss-of-field the machine impedance trajectory moves to Xd. Discussed simulating a synchronous condenser with and without flywheel to see what if any difference there would be between the two cases. Question is for the dual mho scheme (both with negative Xd/2 offset), do we need two zones? Rob Messel will try to provide typical flywheel settings, and Steve Mueller will ask his Planning department to perform loss-of-field and stability studies for hydro machines with and without flywheels.

Action Item: Ritwik to check with Normann on his simulation results to plot his results in R-X.

For synchronous generators, the dual zone LOF has two mho elements both with negative Xd/2 offset. One large zone with diameter Xd, one small zone with diameter 1pu. Since a sync condenser can't slip a pole(?), the impedance locus won't oscillate between Xd/Xd' and Xq/Xq'. Suggestion was made to use a straight line below the R axis and below the maximum incoming reactive. Modified suggestion use a very large mho element with offset of same setting as the straight line (Xd'/2). If the impedance locus goes below that line, LOF declared. Some discussion about not setting the mho element diameter too large so that an unforeseen impedance locus travels into it and results in a false trip.

Set time delay longer than 15 cycles to avoid PRC-026 compliance.

Two WG members shared experience with setting conventional two-zone LOF (both negative offset) on hydro machines used also as synchronous condensers. The 40Z2 (diameter Xd) is set to trip in 45 cycles but will trip in 15 cycles if terminal positive sequence voltage is below 80%. Another WG member shared similar experience doing same for a hydro generator at the end of a long line (they do decrease the 40 diameter). This may be an option for our paper to recommend.

Some discussion over whether a synchronous condenser has a UEL or SSSL. Since SSSL is an angular limitation there should not be such a limit for a synchronous condenser. If the

synchronous condenser is connected to an IBR system, the limit could be a system limit but not an angular limit.

WG discussed a presentation given at the IEEE General meeting that showed the model of a utility in Australia with a synchronous condenser going out of step in an IBR dominated system. However, the presentation did not allow may question or go into any of the details needed to pass through technical scrutiny. WG member reported one utility in Australia has experience with sync condenser going out of step. Chair reminded that Normann concluded that is possible but that they will not slip a pole.

Action Item: Jason Eruneo will check with Andrew Isaacs (Electranix) about a study with sync condensers in IBR system.

Some discussion over setting a single blinder mho element for out of step anyway just in case, and configure to alarm and increment a slip counter.

Question about effect of voltage on the mho circle -- response was it doesn't change in R-X (but does in P-Q).

WG member asked about the need for reverse power for synchronous condensers for increased bearing friction or blowdown failure - yes needed. C37.102 addresses reverse power for loss of prime mover but not for synchronous condensers.

Next meeting:
Single session. With room for 40 and a projector. Request no conflict with D29. J17, J20, 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: 5th WG Meeting September 19, 2023
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 19th, with 14 participants in person, out of them, 6 members and 8 guests. A quorum was achieved.

Minutes of the May 9th, 2023, meeting in Las Vegas were approved.

Juan Gers presented an updated version of the paper in two-column format which has 20 pages. The participants agreed to reduce sections corresponding to fundamental of stability, generator modeling and controls, reference to NERC standards, information of the case example and the conclusions. Gary Kobet suggested to make more references to the paper prepared by the WG J13 and so to reduce the length of the paper being prepared by this group.

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Afterwards, the contribution of Ritwik Chowdhury was presented, which includes changes and text deletions that bring the total number of pages to 14. The group agreed to make efforts to reduce the total number of pages of the summary paper to 10 as far as possible.

Juan Gers will adjust the section on fundamentals and the data information of the case example and Mike Basler the sections of Generator Operating Limits, Characteristics of PSS and Dynamic Response Modeling. Other membres offered support to achieve the number of pages. The new version should be circulated by the middle of October. It is expected to receive the new comments from Members and Guests in one month time. If the comments are not substantial, the changes will be implemented and the final paper will be sent to the J Subcommittee prior to the meeting in January.

Next meeting:
Single session with accommodations for 30 people and a computer projector is requested.
Please avoid conflicts with J17.

J27: <u>Summary Paper - Revision of C37.106, Guide for Abnormal Frequency Protection for Generating Units</u>
Chair: Bracy Nesbit
Vice Chair: Jay Mearns
Output: Summary Paper
Established Date: May 11, 2022
Status: 4th Meeting September 19, 2023, 1:00pm
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: 16 - 6 members and 10 guests
Bracy Nesbit -LCRA, Will English - CMSEnergy, Jorge Cintron - USNRC, Mathew King – HDR Eng, David Reese – B&Mc, Sungsoo Kim – TRC, Gary Kobet – TVA, Ritwik Chowdhury - SEL, Rob Messel – Siemens, Sunil Kabra – Westinghouse, Steve Conrad – Retired, Alexis Mezco – TRC, Doug Weisz – Beckwith, Laurel Branch – TVA, Randy Hamilton – Basler Elect Co, Vijay Shanmugasundaram – B&Mc

a) Check for Quorum – 6/11 members present. Quorum met late in the meeting and Chair did not recognize this.
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. Members joined later in the meeting after review of previous minutes.
f) <u>Technical topics</u>
   1) The working group reviewed the updated Abstract. Edits were made by working group. The updated version to be sent out for any additional comments and edits.
   2) The working group reviewed summary paper edits for
      - Compress Abnormal Frequency Protection section to essential narratives

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- Annex A – short summary
- Annex B – Hydraulic Turbine Generator

3) The WG reviewed the draft presentation of the summary paper. Several updates were made; however, time expired before all comments could be captured. The draft version will be sent out for comments.
4) The WG discussed that the summary paper can possibly be in conference format or PES format.
5) 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) Bracy - Send current form of summary paper for WG Ballot on content.
2) WG – Decide on final format of paper.
3) Bracy – Send current form of Abstract with paper for WG Ballot.
4) Bracy – Send draft presentation to WG for comments.
5) 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: 1:55 PM

Next meeting:
Single session. With room for 15 and a projector. Please avoid conflicts with J15.

JTF28: <u>Prepare J6, J14 Papers for Publication</u>
Chair: Zeeky Bukhala
Vice Chair: Dale Finney
Established Date: May 11, 2022
Status: Task Force 3rd Meeting September 19, 2023
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 third meeting on Tuesday, September 19th, 2023, with 2 members and 3 guests in attendance.

I. Welcome / Introductions
   a) The Chair kicked off the meeting at 3:40pm EDT and welcomed attendees to the task force's third meeting.
II. Approval of Meeting Minutes. January and May 2023 meeting minutes will be circulated by email for approval.
III. J6 (Protection issues Related to Pumped Storage Hydro (PSH) Units)
   a) Chair and J Subcommittee Chair provided a brief history of why the task force was formed.
   b) Paper was circulated to Task Force members and available authors of the previous paper and approved for circulation to J subcommittee.

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c) Paper was circulated to J subcommittee for balloting.
   i. 97% response rate. There were a total of 129 comments including 38 that must be satisfied.
   ii. There was 1 negative ballot with comments.
d) Reviewed ballot comments:
   i. The 38 comments were reviewed and resolved.
   ii. Negative ballot must be satisfied comments were reviewed and accepted. Chair to reach out to author of negative ballot to determine if any further action is expected.
e) Next Steps
   i. September 30th, 2023 – Submit edited paper to PSRC Officers for approval.

IV. J14 (Plant Protection Issues Associated with Black Starting of Generators)
a) Chair and J Subcommittee Chair provided a brief history of why the task force was formed.
b) J14 report needs to cite any parts of the paper that were drawn from other material.
c) Tom Beckwith took the assignment to review the report against the transaction paper referenced and cite references where appropriate
d) Next steps
   i. September 30th, 2023 – Chair to send J14 and reference paper to Tom Beckwith.
   ii. October 30th, 2023 – Distribute edited document to Task Force and original authors for approval.
   iii. Mid-November 2023– Ballots due to the Chair.
   iv. November 30th, 2023 – Resolve Task Force comments at virtual meeting.
   v. Mid-December, 2023– Submit edited paper to Subcommittee for approval.
   vi. January 2024 – Resolve Subcommittee comments at January meeting.
   vii. January 30th, 2024 – Submit draft paper to PSRC Officers for approval

V. Meeting adjourned at 4:40pm EDT

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 – C50.12 is now in recirculation. Dr. Yalla will provide the revision to J SC once the document is finalized.

Industry Applications Society (IAS) / Industrial & Commercial Power Systems (I&CPS) – D. Haas – No report.

Nuclear 1E WG – P Kumar – Nothing to report.

Old Business:

J SC Scope – A J SC member presented the idea of creating a task force to determine whether or not another IEEE committee currently has responsibility for protection of inverter based

resources, specifically WTG's (type 3 and type 4), PV's and BESS. If no committee has responsibility, then the task force would recommend to the committee where this protection should be addressed. Jason Eruneo volunteered to develop a motion related to this topic for discussion and vote at the January meeting.

New Business:

J SC Leadership – This is Gary Kobet's last meeting as J SC Chair. Effective January 2024, Will English will be J Subcommittee chair and Jason Eruneo will be J Subcommittee vice chair.

Member Lists and Quorum – WG and task force chairs were asked to present a list of their members at each meeting to assist with determining quorum. A reminder was given that with the small size of each J SC working group, a majority is required for quorum. For example, a group having 12 or 13 members would need to have 7 members present for quorum.

Summary Paper Requirements – The J SC Chair provided a general guideline for Summary Papers, suggesting an appropriate length would be 8-10 pages. It was also stated that Summary Papers shall follow the IEEE PES report, conference paper, specific conference, or meeting format requirements as applicable.

Adjournment:

Motion to adjourn was made by Steve Conrad and seconded by Russ Patterson. Meeting was adjourned at 4:01 PM EDT.

K Substation Protection Subcommittee Meeting Notes, September 20, 2023, 2:45 – 4:10 EST – Myrtle Beach, SC

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 37 guests were in attendance.**
- **Check for quorum (16 out of 29 members, need 15 for quorum), quorum was made**
- **Approval of agenda (Ratan Das motioned, Sebastian seconded, approved unanimously)**
- **Approval of previous meeting minutes (Hillmon Ladner-Garcia motioned, Pratap Mysore seconded, approved unanimously)**
- **Advisory Committee items of interest**
    - PSRC and PSCC 257 attendees
    - September 2024 meeting, confirmed in Scottsville, AZ.
    - Looking for main committee presentation in January 2024 meeting and beyond.
    - Member Planet web service still going to be the member database. Please make sure to create a profile in MemberPlanet if you have not done so already.
    - Please provide meeting minutes to Brandon by September 29th. Please use template to allow for easier incorporation into the subcommittee minutes.
    - PSRC Webmaster (Rick Gamble) is looking for assistance in managing the PSRC website. Anyone with website design capabilities and an interest in supporting Rick with ongoing updates, please coordinate with Rick directly.
    - Subcommittee leadership will be reaching out to WG chairs for updated WG rosters for use in updating the PSRC Director.

Working Group Reports:

K12: PC37.431.20 IEEE Guide for Protecting Transmission ~~Static Shunt~~ Dynamic Reactive Power Compensators

Chair: Satish Samineni

Vice Chair: Tapan Manna

Secretary: -

Output: Guide

Established Date: 2013

Expected Completion Date: 2023

Draft: 27

Assignment: To work jointly with Substations WG I9 to write a guide for protecting transmission ~~static shunt~~ 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 ~~static shunt~~ dynamic reactive power compensators.

Meeting Notes:

PSRC WG K12 had a meeting on Tuesday, September 19th, 2023. K12 had 2 members and 2 guests present. Quorum was not met. May meeting minutes will be approved through email.

Provided an update from WG I9 from last week.

- Submitted a PAR modification request to reconcile a term change from 'Static Shunt Compensator' to 'Dynamic Reactive Power Compensator'
- Submitted PAR extension request as the expiration date is currently 12/31/2023
- Resolved several comments from Siemens Energy and plan to have a web meeting in couple of weeks to finalize.
- Plan to move to MEC and ballot pool activities by November

The next in-person meeting will be a joint meeting with substations WG I9 and request to coordinate with them.

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: 2023

Draft: 1.6

Assignment: Revise and Update C37.99, IEEE Guide for the Protection of Shunt Capacitors

Formalities:

- The WG met on 09/19/2023
- Officer presiding – Rick Gamble
- The meeting was called to order by the Chair
- Introductions were made
- The meeting was attended by 13 voting members and 10 non-voting members
- Quorum was met
- September 2023 Agenda was approved
- Meeting Minutes from May 2023 were reviewed and approved
- Chair reviewed the Patent, Copyright, and Participation Behavior Code of Ethics slides
- PAR Extension Reason was approved
- Removing Section 8.7 was approved
- Discussed previous writing assignments:
    - Unfused Capacitor Bank Section
    - Section 9.1 (KTF 32 is reviewing)
    - Section 9.3, & 9.4 (K12 is reviewing)
- WG Adjourn

Action Items:

- Secretary to submit author of analytical paper LOA
- WG to review Section 10
- Writing Assignments:
    - 46 Directional Element
    - Reviewing/Revising Tables & Figures
    - Analytical Annex Additions
    - Scrub guide for "naughty words"

Motion to K Subcommittee by Rick Gamble, Seconded by Pratap Mysore

Motion: *Working Group K25 motions to extend the PAR for IEEE Guide C37.99, IEEE Guide for the Protection of Shunt Capacitor Banks, for 2 years.*

Reason: *Due to leadership changes in the working group, a refocus effort has been completed. This extension will allow us more time to streamline the revisions being suggested by the working group.*

Motion passed unanimously

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

Meeting Notes:

1. Introduction and agenda (24 participants and 11 voting members). Reached quorum (Total 18 working group members). Minutes were shown from July 6 meeting minutes were approved.
2. Copyright, participant behavior and patent slides were briefly shown and discussed during the meeting.
3. Pratap presented briefly on shorting of turns and impedance variation for oil type shunt reactors. This topic will be discussed further but will not be included in present K26 guide. Slides on this topic will be shared when available.
4. Initial ballot comments and statistics was discussed. During initial recirculation new definition "Shunt reactor Magnetizing inrush" and minor updates for other definitions (after WG approval), was shared with I2 group (Mel Swanson) on 8/23 and 9/19 via email.
5. Recirculation 1 documents, K26 CRG proposal, and resolution was discussed briefly. All the comments were already discussed/presented to comments owners and WG voting members before the September 19 meeting. No concerns from any of the members in starting recirculation 2 starting 9/25/2023.
6. This may be the last in person meeting for K26 WG but may arrange remote meetings as needed. WG K34 was created to write a summary on Shunt Reactor Guide. K34 and was approved by K subcommittee.
7. K26 recirculation 2, (Draft version 3.6 dated Sep 25) started on Sep 25 and will close on Oct 5.
8. Motion to close 2:50 PM

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: 2, September 8th 2023

Assignment: Review and update C37.95 IEEE Guide for Protective Relaying of Utility-Consumer Interconnections

14th WG Meeting

Meeting Notes:

- The chair started the meeting by presenting the IEEE Patent Slides and Participant Behavior slides. No patent issues were raised.
- WG did not meet quorum. We will move to approve minutes by email.
- WG approved the meeting agenda with a motion by Brandon Davies and second by Dean Miller. None opposed and no discussion.
- The WG resumed discussion on adding a section on IBR for Section 7
    - The group agrees the IBR section should be added with high level information and possibly direct readers to references. The goal is to create an awareness of the challenges and ongoing research on this topic.
    - We could also explore re-writing section 7.1 to divide the different study types and provide some clarity.
    - Carolyn Sun and Alexis Mezco took an assignment to propose text to resolve this discussion.
- The WG then discussed a review comment highlighting deficiency of the Definition of X/R ration in the document. The term is used twice in the document when listing data exchange suggestions between utilities and consumers. We will look at possibly removing the definition from the document and adding a reference if appropriate.
- For the January meeting we will need a room for 30 people and a projector.
- In general please avoid conflicts with K subcommittee working groups if possible.

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 9 of 14 voting members
- Members approve the May 2023 minutes of meeting
    - First by Brian Boysen, seconded by Sudarshan Byreddy
- Version 0 of document is available on the PSRC sharepoint via http://psrc.sharefile.com in the K29 folder
- The team discussed the draft 0 that contains the working group review comments:
    - Agreed to update the title of section 2.4 to match the bus protection guide
    - Retrip discussion:
        - The term "retrip" is only mentioned once in the document. Due to level of severity of poor retrip implementation (i.e. bus outage)
        - Retrip similar to partial breaker failure initiate, where we do NOT trip upstream breaker, but trip same coil via different contact
        - Slight delay between trip and re-trip beneficial
        - Team agreed it would be good to add a section dedicated to this topic
        - Action Item: **Shivam Prabhakar**- add new section on re-trip by 10/31
            - To include considerations for maintenance tests and first troubleshooting step when there is a slow breaker
            - Also update Section 2.3 (4th to last paragraph) which also relates to breaker failure causes
    - Changed title of section to "Blocking zone-interlock," regarding slight delay in upstream CB to avoid tripping for a fault that a feeder trip could isolate instead
        - This becomes an issue if you have DER, when feeder can pick up for bus fault but then block it
        - Bus guide is missing information about differential by using relay with enough inputs to use direct CTs
        - Action item: **Colleen Konsavage**-- add new section regarding differential via direct input CT (instead of summed PTs) by 10/31.
    - There is some language regarding difficulty to detect high impedance faults?
        - High impedance fault detection is more related to line protection than station protection
        - This is out of scope for the group. Remove.
        - Action item**: Sebastien Billaut**—add new paragraph or clarification to document intro section regarding what is in and out of scope by 10/10
        - Action item**: Sebastien Billaut**—flag any other items that may appear out of scope throughout document by 10/10
    - Restricted Earth Fault (REF) discussion:
        - Known to be associated with misoperations due to addition of complexity
        - Works if applied correctly, but often applied incorrectly, especially regarding CT polarity

        - "Gains you very little" even when applied correctly according to one member
    - Action item**: Bernard Matta**—add paragraph to Section 2.9 regarding words of caution associated with REF, complexity, and misapplication by 10/31
- Motion to adjourn

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: 2.0

Summary:

- Met with 33 in person attendees and 2 virtual attendees
- 15 of 19 Voting Members were in attendance - Quorum was achieved
- WG has started to address WG internal ballot comments – Roughly 150 overall comments
- Approval of August web meeting minutes was completed

Details:

- Agenda was presented and reviewed – A motion to approve the agenda was made by Gene Henneberg and seconded by Don Ware. 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
- Vahid presented the overview of the status of the working group ballot comment resolution. Four subgroups have been formed each tasked with resolution of comments related to portions of the guide.
- A motion to approve the August minutes was made by Hillmon Ladner-Garcia and seconded by Gene Henneberg. There was no discussion and the motion passed.
- Proposed update to Figure 5 and section 6.2 related to the logic driving retrip logic. The working group discussed the advantages and disadvantages of the two options shown. The working group discussed taking a wider look at the overall section with additional discussion related to dependability vs. security of each scheme. The group also recommended removing language "Some utilities" as a lead in to several of the working. The reason for referencing to "some utilities" could be to highlight common practices and avoid use of terminologies such as should. This feedback will be brought to the subgroup working on this section to propose an update.
- Several comments related to section 6.15
    - The working group discussed renaming the title of 6.15.1 per comment. After discussion the working group agreed that the existing title was okay "as is", and recommended not to change the title.
    - The need to update Figure 28 was discussed. The new figure in C37.102 was rearranged to be more aesthetically pleasing. WG also discussed to add more language in the body of the BF Guide, and not just as part of a Figure title. Propose to include a text such as "this is discussed in more detail in C37.102". To get a copy of the updated figure from C37.102, the WG will request a copy from the C37.102 WG chair. There was a lot of discussion if it is appropriate to have this same content covered in two separate guides. Primary concern is if for any reason either C37.102 or C37.11 are updates, there remains a possibility of discrepancy or differences between the two Guides. IEEE SA mentioned we could have the same figure as already planned for C37.102
    - Clair Patti motioned that we coordinate with working group for C37.102 and request their Visio source file for Figure 75 to replace. Motion passed.

  - Vahid briefly presented other updates. Inclusion of phase discrepancy (pole disagreement) as part of the comments received in coordination with WG D48 (Line protection WG).
  - WG members will coordinate for a web meeting possibly in mid-late October
- The meeting adjourned at 10:30AM EST.

Action Item:

- Alexis Mezco has expressed interest to support subgroup 1. Vahid forward the subgroup meeting invites.

KFT32: 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.

Meeting Notes:

PSRC KTF32 had a meeting on Tuesday, September 19th, 2023. KTF32 had 14 attendees.

- We had a good discussion on this topic and majority of the attendees agree with the need for guidance on protecting harmonic filter banks.
- We plan to review material related to harmonic filter banks and have a web meeting in November.

KFT33: C37.234 Corrigendum for Ungrounded Bus Protection

Chair : Satish Samineni

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 3:40 on September 19th, 2023 with 7 attendees.

The chair presented the issue, which is that the guide focuses on very low shunt capacitance current where any of the shelves PTs can perform the bus voltage stabilization.

The Chair made the slingshot presentation.

We discussed the options, and an amendment appears to be the best way to proceed if the task force decides to approve.

We were unable to decide on forming a working group at this point, we are looking for increased attendance at the next meeting in January to help form a decision.

Liaison Reports:

T&D Committee, Capacitor Subcommittee, **Pratap Mysore,**
http://grouper.ieee.org/groups/td/cap/

Old Business

None

New Business

Kamal motion to form a WG with the assignment of developing a summary paper for the updated C37.109 guide which is nearing completion. Motion was seconded by Satish Samineni There was discussion of the use of General Meeting rather than transactions papers given the recent challenges getting approval for transactions papers related to work already completed. There was additional discussion on challenges getting summary papers approved by various relay conferences. Consideration for submitting these to the IEEE general meeting was discussed as another option to promote these types of papers. The motion was approved unanimously by the subcommittee. Working group K34 will meet in January.

Transformers Committee has an open PAR working group to revise C57.135 IEEE Guide for the Application, Specification, and Testing of Phase-Shifting Transformers and is revising the PAR to accommodate publishing as dual logo IEEE/IEC Standard. Mike Thompson discussed a suggestion for PSRC Joint Committee with this working group in a non-lead liaison role to provide PSRC input on protection related topics within the existing guide and alignment with C37.245. A motion was made Mike Thompson and seconded by Lubo Sevov to bring a recommendation from the K subcommittee to the main committee meeting for PSRC with accept Joint Committee work of PC57.135 in the role of liaison. Motion passed unanimously.

Items of General Interest

Sebastian Billaut shared a presentation related to impact of capacitive unbalance on stabilizing resistance for ungrounded busses. This presentation is related to the work being considered of KTF33 and encourages thought with interest in this topic to consider attending the KTF33 meeting at the JTCM in January.

Adjourn

Addendum C: PSRC Sept 2023 Meeting Agenda, Draft 6 (Final)

IEEE PSRC / PSCC Committee Meeting Agenda - DRAFT 6

DoubleTree Oceanfront, Myrtle Beach, SC, USA

WG / URL		Output	IEEE SA reference	**MONDAY - SEPTEMBER 18, 2023 (All times are Eastern Daylight Savings Time, EDT)**	CHAIR	EST	Room	cap.
				MONDAY - 8:00 AM - 9:10 AM				
A3				Power System Communications and Cybersecurity Committee Newcomer's Orientation	James Formea	15	Carolina B	24
H54	*	Standard	C37.111	Revision of IEEE C37.111-2013/IEC 60255-24:2013 Standard for Common Format for Transient Data Exchange (COMTRADE) - DOUBLE SESSION - 1 OF 2	Mark Admiak	30	Atlantic A	33
P5	*		P1615	Revision of IEEE P1615	Jim Bougie	30	Carolina A	33
				MONDAY - 9:20 AM - 10:30 AM				
H54	*	Standard	C37.111	Revision of IEEE C37.111-2013/IEC 60255-24:2013 Standard for Common Format for Transient Data Exchange (COMTRADE) - DOUBLE SESSION - 2 OF 2	Mark Admiak	30	Atlantic A	33
S9TF				Study Group on Utility IT-OT Cybersecurity Challenges in Roles and Terminology	Laughner	40	Carolina A	33
				MONDAY - 10:40 AM - 11:50 AM				
B4	#			(By Invitation only) PSRC Long Range Planning WG	Murty Yalla	20	Atlantic B	24
S11TF				Task Force on Roadmap Development for S0	Dan Goodlet Larry Collier	20	Carolina A	33
				MONDAY - 11:50 AM - 1:00 PM LUNCH BREAK - on your own				
				MONDAY - 1:00 PM - 2:10 PM				
B2 A2TF	#			(By Invitation only) Fellows Awards (Joint with PSRC B2 and PSCC A2 TF)	T.W. Cease	15	Atlantic B	24
H49		Report		CANCELLED -- Application considerations for the Use of Packet-Switched Communication Channels for pilot protection and teleprotection schemes	Steve Klecker			
H53 P16	*	Guide	P1854	Revision of IEEE Guide P1854 Use Guide for Smart Distribution Applications	Xiangyu Ding	20	Carolina B	24
P15	*			1815.2 DNP3 Profile for DER Communications	Thibodeau	20	Carolina A	33
				MONDAY - 2:20 PM - 3:30 PM				
B1	#			(By Invitation only) PSRC Awards and Recognition Working Group	Andre Uribe	20	Atlantic B	24
J17	*	Guide	C37.102	Revision of PC37.102, Guide for AC Generator Protection	Manish Das	40	Atlantic A	33
P14	*			Guide,C37.236 Protective Relay Applications Over Digital Communication Channels	Dahlin	20	Carolina B	24
S10TF				Study Group on Utility & Municipality Challenges on Understanding Cybersecurity Standards	Pack	40	Carolina A	33
				MONDAY - 3:40 PM - 4:50 PM				
B	#			(By Invitation only) PSRC Officer / SC Chair Coordination Meeting	Mike Thompson	15	Atlantic B	24
J16	*	Guide	C37.101	Revision of PC37.101, Guide for Generator Ground Protection (DOUBLE SESSION 1 OF 2)	Ryan Carlson	30	Atlantic A	33
P21TF I49				Roadmap for developing new or updating existing IEEE standards to address issues of Centralized Protection and Control (CPC) Systems	Craig Preuss Brian Mugalian	30	Carolina A	33
SCASC				Synchrophasor Conformity Assessment Steering Committee (SCASC)	Allen Goldstein	20	Carolina B	24
				MONDAY - 5:00 PM - 6:10 PM				
C23		On going		Coordination of Synchrophasor Related Activities	Yi Hu	20	Atlantic B	24
J16	*	Guide	C37.101	Revision of PC37.101, Guide for Generator Ground Protection (DOUBLE SESSION 2 OF 2)	Ryan Carlson	30	Atlantic A	33
P18* SCC21	*			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	Johnson	20	Carolina A	33
S2				IEEE P1711.1, Serial SCADA Protection Protocol (SSPP) Guide for using Secure SCADA Communications Protocol (SSCP) and Serial SCADA Protection Protocol	Cenzon	20	Carolina B	24
				MONDAY - 6:00 PM - 10:00 PM - RECEPTION DINNER and AWARDS CEREMONY				
				Reception - 6:00 PM - 7:00 PM		200	Springs	220
				Dinner and Awards Ceremony 7:00 PM - 10:00 PM	Uribe	200	Springs	220

REFER TO PRINTED AGENDA NEAR REGISTRATION DESK FOR ANY LAST-MINUTE CHANGES

* - Standards related # - Closed session (by invitation) EST - estimated attendance

WG / URL		Output	IEEE SA reference	**TUESDAY - SEPTEMBER 19, 2023 (All times are Eastern Daylight Savings Time, EDT)**	CHAIR	EST		cap.
				TUESDAY - 8:00 AM - 9:10 AM				
B3				Power System Relaying and Control Committee Newcomer's Orientation	Henneberg	20	Atlantic B	24
C1	*			Revision of Guide for PLC Appications	Bell	30	Carolina A	33
C38	*	Guide	2030.12	Design of Microgrid Protection Systems	S. S. (Mani) Venkata	60	Springs FGH	45
C48		Summary Paper		Summary paper of C37.120 Guide for Protection System Redundancy for Power System Reliability	Alla Deronja	20	Carolina D	24
D44	*	Guide	C37.114	Revise C37.114 (Fault Location Guide)	Sebastien Billaut	30	Carolina C	33
H46	*	Recd Practice	C37.1.3	HMI used in Substation Automation Systems	Matt Black	30	Atlantic C	33
H50		Report		Requirements for Time Sources in Protection & Control Systems	Ouellette	30	Atlantic A	33
I26		Report		Mathematical Models of Instrument Transformers	Mike Meisinger	30	Springs E	21
I31	*	Standard	P1613	Standard for Environmental and Testing Requirements for Devices with Communications Functions Used With Electric Power Apparatus	Brian Mugalian	20	Atlantic D	24
I4		On Going		International Standards Development (IEC Advisory)	Eric Udren	15	Carolina E	18
J15		Report		Investigation of the criteria for the transfer of motor buses	Wayne Hartmann	30	Springs ABC	45
				TUESDAY - 9:20 AM - 10:30 AM				
C45		Report		Protection and short-circuit modeling of systems with high penetration of inverter-based resources	Ali Hooshyar	60	Springs FGH	45
D30		Tutorial		Application and Setting Mho/Quad Distance Elements on TLines	Karl Zimmerman	30	Atlantic C	33
H31		Report		Common Protection & Control parameters for COMSET	Depak Maragal	35	Springs ABC	45
H40	*	Recd Practice	C37.1.2	Databases Used in Utility Automation Systems	Theo Laughner	15	Carolina E	18
I32		Review		A Survey of Protective System Test Practices	Uribe	20	Atlantic D	24
I41	*	Standard	PC37.90.3	Review of IEEE C37.90.3 - IEEE Standard Electrostatic Discharge Tests for Protective Relays	Steve Turner	20	Carolina D	24
J26		Summary Paper		Summary Paper - Modeling of Generator Controls for Coordinating Generator Relays	Juan Gers	20	Springs E	21
K12	*	Guide	C37.431.20	Guide for Prot Static VAR Compensators Joint w/ Subst I9	Satish Samineni	20	Atlantic B	24
K31	*	Guide	C37.119	Guide for Breaker Failure Protection of Power Circuit Breakers	Vahid Madani	30	Carolina C	33
P20	*			Joint Revision of IEC 61850-9-3	Vandiver	20	Carolina B	24
S16TF				Task Force on Systems for Detecting and Preventing Network Intrusions in Electric Power Systems	Carvalheira	20	Carolina A	33
				TUESDAY - 10:40 AM - 11:50 AM				
C41		Report		Investigate performance requirements for Distribution PMUs	Ken Martin	15	Carolina B	24
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	Springs FGH	45
D29		Tutorial		CANCELLED- Tutorial for Setting Impedance-Based Power Swing Relaying on Transmission Lines	Kevin Jones	30		
D48		Report		Single Phase Operations (Tripping and Reclosing) on Transmission Lines	Kamal Garg	30	Atlantic C	33
H41	*	Standard	1646	Communication Delivery Time Performance Requirements	Dave Dolezilek	15	Carolina D	24
I33		Report		Review of Relaying Testing Terms	Scott Cooper	10	Atlantic D	24
J20		Report		Report on Practices for generator synchronizing systems	Jason Eruneo	30	Carolina C	33
J23		Report		Report on Generator Condition Monitoring	Steve Turner	20	Springs E	21
K27	*	Guide	C37.95	Guide for the Protective Relaying of Utility-Consumer Interconnections	Paul Elkin	30	Atlantic A	33
K29		Report		Reducing outage durations through improved protection and autorestoration in distribution substations	Sebastien Billaut	20	Atlantic B	24
P19	*			Universal Utility Data Exchange (UUDEX)	S. Mix	30	Carolina A	33
				TUESDAY - 11:50 AM - 1:00 PM LUNCH BREAK - on your own				
L&L				Lunch and Learn Session (Pre-purchase Option): Shunt Reactor Events and Failures - Gary Kobet, Pratap Mysore	Kobet / Mysore		Dunes	60

WG / URL		Output	IEEE SA reference	**TUESDAY - SEPTEMBER 19, 2023 (All times are Eastern Daylight Savings Time, EDT)**	CHAIR	EST		cap.
				TUESDAY - 1:00 PM - 2:10 PM				
C2	*			C93.4 – Standard for Power-Line Carrier Line-Tuning Equipment	McGuire	20	Carolina B	24
C29		Report		Power System Testing Methods for Power Swing Blocking and Out of Step Tripping	Kevin Jones	30	Carolina C	33
CTF47				Relay Modeling in Electromechanical Dynamic Simulations for Power System Dynamic Performance (PSDP) committee	Evangelos Farantatos	20	Atlantic D	24
D35		Report		Evaluation of Transmission Line Pilot Protection Schemes	Rick Gamble	25	Springs ABC	45
D43		Report		Update PSRC Report "Effect of DA on Protective Relaying"	Greg Ryan	20	Springs FGH	45
H47		Report		Investigate Impact of Digital Comms on Prot & Control Applications	Mital Kanabar	30	Atlantic C	33
HTF55		Report		Investigate Distributed Cyber Physical Assesment for Grid Resilience	Jeff Pack	20	Carolina D	24
I37	*	Standard	PC37.90	Review of Standard for Relays and Relay Systems Associated with Electric Power Apparatus	Marilyn Ramirez	20	Atlantic A	33
I45		Report		Grounding and Bonding Issues Associated With Substation Wiring Practices and Instrumentation	Adrian Zvarych	20	Atlantic B	24
J27		Summary Paper		Summary Paper - Revision of PC37.106, Guide for Abnormal Frequency Protection for Generating Units	Nesbit	20	Springs E	21
KTF32				Task force exploring the need of creating a separate guide for protection of filter banks.	Satish Samineni	15	Carolina E	18
S17				Task Force on Use of SBOM in the Energy Sector	Thibodeau	30	Carolina A	33
				TUESDAY - 2:20 PM - 3:30 PM				
C44		Paper		Prepare a Summary Paper for IEEE Transactions on Power Delivery 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	Carolina D	24
D37		Report		Impact of series compensation on transmission line protection	Mike Kockott	25	Atlantic B	24
D45		Report		Reduction of Forest Fire Hazard	Jon Sykes	50	Springs ABC	45
H27	*	Standard	C37.251	File format for IED configuration Data (COMSET)	Mario Capuozzo	30	Carolina C	33
H30		Report		IEC 61850 User Feedback	Depak Maragal	50	Springs FGH	45
H52	*	Standard	C37.232	Common Format for Naming Time Sequence Data Files, C37.232, COMNAME	Ellery Blood	15	Atlantic D	24
H6		Summary Paper		Application Testing of IEC 61850 based Systems	Charlie Sufana	30	Atlantic C	33
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	Springs E	21
K26	*	Guide	C37.109	Guide for the Protection of Shunt Reactors	Kamal Garg	30	Atlantic A	33
P2	*			IEEE 1815, Electric Power Systems Communications – Distributed Network Protocol (DNP3)	Farquharson	20	Carolina B	24
S15	*			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	Anderson	30	Carolina A	33
				TUESDAY - 3:40 PM - 4:50 PM				
CTF51		Report		CANCELLED- Investigate revising C37.117, Guide for the Application of Protective Relays Used for Abnormal Frequency Load Shedding and Restoration	Kevin Jones	30		
CTF52	*	Guide		Investigate interest in revising standard C37.246 IEEE Guide for Protection System of Transmission-to-Generation Interconnections.	Moncey	40	Springs ABC	45
D38		Report		Impact of High SIR on Line Relaying	Walker	30	Carolina C	33
D50		Paper		Summary Paper for C37.104 Guide for Automatic Relcosing on AC Distribution and Transmission Lines	Manish Patel	20	Atlantic C	33
H44	*	Guide	C2030.101.1	Monitoring & Diag IEC 61850 GOOSE and Sampled Values Based Systems	Aaron Martin	40	Springs FGH	45
H51	*	Standard	C37.239	COMFEDE Revision	Mark Admiak	15	Carolina D	24
I44		Report		Skills Required to Program, Commission, Test, and Maintain Ethernet Based PAC Systems	Andre Uribe	20	Atlantic B	24
J24		Report		Report on Synchronous Generator Disturbance Recording	Shane Haveron	10	Carolina E	18
JTF28				Prepare J6, J14 papers for publication	Zeeky Bukhala	15	Springs E	21
K25	*	Guide	C37.99	Guide for the Protection of Shunt Capacitors	Rick Gamble	25	Atlantic A	33
KTF33				Task force to determine if the K Subcommittee would like to create a PAR to create corrigendum for cliarity in bus guide regarding ungrounded bus.	Sebastien Billaut	15	Atlantic D	
P12	*			Report on Analog Leased Lines Withdrawal of Service	Benou	20	Carolina B	24
P9 C40	*			Prepare a tutorial from the work of C37.247 Standard for Phasor Data Concentrators, C37.118.2, Synchrophasor Data Transfer for Power Systems	Vasudev Gharpure	10	Carolina A	33
				TUESDAY - 5:00 PM - 6:30 PM				
B	#			(By Invitation only) PSRC Advisory Committee (UNTIL 6:30 PM)	Mike Thompson	22	Atlantic A	33

IEEE PSRC / PSCC Committee Meeting Agenda - DRAFT 6

WG / URL		Output	IEEE SA reference	**WEDNESDAY - SEPTEMBER 20, 2023 (All times are Eastern Daylight Savings Time, EDT)**	CHAIR	EST		cap.
				WEDNESDAY - 8:00 AM - 9:10 AM				
B11		On going		SC21 Distributed Resources Standard Coordination	Ben Kazimier	20	Atlantic B	24
C26	*	Guide	C37.233	Guide for Power System Protection Testing	Don Ware		Springs E	21
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	Atlantic A	33
CTF53		Report		Investigate interest in developing a technical report to document the current utility data collection and event labelling practice (through industry survey) and the data needs in developement, implementation, testing, and deployment of artificial intelligence /machine learning and other types of data analytics applications, and to make recommendations based on the identified gaps.	Dan Sabin	30	Springs ABC	45
D47	*	Guide	C37.243	Guide for Application of Digital Line Current Differential Relays Using Digital Communication	Alla Deronja	40	Springs FGH	45
D51	*	Guide	C37.104	Protection Consideration for Single Phase Tripping and Reclosing of Distribution Lines	Brian Boysen	30	Carolina C	33
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	Carolina D	24
I48	*	Guide	PC37.103	Revision of IEEE C37.103 Guide for Differential and Polarizing Relay Circuit Testing	Mohit Sharma	15	Carolina E	18
J22	*	Guide	C37.96	Revision of PC37.96, Guide for AC Motor Protection (DOUBLE SESSION 1 OF 2)	Zeeky Bukhala	30	Atlantic C	33
P10	*			IEEE P2664, Standard for Streaming Telemetry Transport Protocol	K. Martin	15	Carolina B	24
P13				Beginners' Guide to IEC 61850	Carvalheira	30	Carolina A	33
				WEDNESDAY - 9:20 AM - 10:30 AM				
C25		Paper		Summary paper and presentation on Protection of Wind Electric Plants	Amin Zamani	30	Carolina C	33
D42	*	Guide	C37.113	Revise C37.113 (Transmission Line Guide)	Jeff Barsch	50	Springs FGH	45
E0				PSCC Wireline Subcommittee	Mulawarman	25	Carolina A	33
H45	*	Guide	C37.300	Guide for Centralized Protection & Control (CPC) Systems within a Substation	Ratan Das	40	Springs ABC	45
I43		Report		EMP Resiliency	Angelo Tempone	20	Atlantic B	24
I47	*	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.	Don Burkart	20	Atlantic D	24
J22	*	Guide	C37.96	Revision of PC37.96, Guide for AC Motor Protection (DOUBLE SESSION 2 OF 2)	Zeeky Bukhala	30	Atlantic C	33
S8	*			P2658 Guide for Cyberseucrity Testing in Electric Power Systems	Wallace	20	Carolina B	24
				WEDNESDAY - 10:40 AM - 11:50 AM				
B10	#	On going		(By Invitation Only) Inverter Based Resources Steering Working Group	Thompson	15	Carolina E	18
C0				PSCC Power Line Carrier Subcommittee	Palmer	20	Carolina A	33
C43		Report		Artificial Intelligence and Machine Learning technologies for power system protection and control applications	Yi Hu	50	Springs FGH	45
DTF53				Investigate a need for a new distribution line protection practices industry survey.	Greg Ryan	20	Springs E	21
I2		On Going		Terminology Usage Review	Mal Swanson	20	Springs ABC	45
J21		Tutorial		Motor Protection Tutorial	Derrick Haas	25	Carolina D	24
J25		Report		Report on Synchronous Condenser Protection	Jason Eruneo	30	Carolina C	33
S7	*		P2808	IEEE Std 2808 Standard for Function Designations used in Electrical Power Systems for Cyber Services and Cybersecurity	Nathan Wallace	20	Carolina B	24
				WEDNESDAY - 11:50 AM - 1:10 PM LUNCH BREAK - on your own				
				WEDNESDAY - 1:10 PM - 2:35 PM				
D				Line Protection Subcommittee	Kao	60	Atlantic AB	75
I				Protection and Control Practices Subcommittee	Chowdhury	60	Atlantic CD	75
S0				PSCC Cybersecurity Subcommittee Meeting	Mix	40	Carolina AB	75
				WEDNESDAY - 2:45 PM - 4:10 PM				
J				Rotating Machinery Subcommittee Meeting	Kobet	40	Atlantic AB	75
K				Substation Protection Subcommittee	Mulawarman	50	Atlantic CD	75
P0				PSCC Protocols and Communication Architecture Subcommittee	Dahlin	40	Carolina AB	75
				WEDNESDAY - 4:20 PM - 5:45 PM				
C				System Protection Subcommittee	Higginson	60	Atlantic AB	75
H				Relay Communications Subcommittee	Aaron Martin	75	Atlantic CD	75
				WEDNESDAY - 6:00 PM - 7:30 PM				
INL PSCCC PSRC				Informational Session: Cyber-Informed Engineering - hosted by Idaho National Laboratory	Formea / Kunsman		Carolina CD	120

WG / URL		Output	IEEE SA reference	**THURSDAY - SEPTEMBER 21, 2023 (All times are Eastern Daylight Savings Time, EDT)**	CHAIR	EST		cap.
				THURSDAY - 7:30 AM - 10:45 AM				
PSRC MC				Power System Relaying and Control (PSRC) Main Committee Meeting	Thompson	210	Springs	220
				Main Committee Presentations:	Niemira			
				IEEE C37.92-2023 IEEE Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources	Eric Udren			
				THURSDAY - 11:00 AM - 1:00 PM				
PSCCC MC				Power System Communications and Cybersecurity Committee (PSCCC) Meeting	Formea	60	Springs	220

Power System Relaying and Control Committee
PSRC Main Committee Meeting Agenda
Thursday, September 21, 2023 7:30 AM - 10:45 AM (EDT)

I.	Call to Order/Introductions/Quorum	Mike Thompson
II.	Approval of May 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.~~ F.	IEC Report	Eric Udren
~~E.~~ D.	SC21 and 1547 Liaison Report	Ben Kazimier
~~F.~~ E.	Standard Coordinator's Report	Don Lukach
	-- Motion to Accept Revisions to PSRC O&P Manual	
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	
	C - System Protection	Michael Higginson
	D - Line Protection	Meyer Kao
	H - Relay Communications	Aaron Martin
	I - Protection and Control Practices	Ritwik Chowdhury
	J - Rotating Machinery	Gary Kobet
	K - Substation Protection	Adi Mulawarman
VI.	Presentations	Jim Niemira
a.	IEEE C37.92-2023 IEEE Standard for Low-Energy Analog Interfaces Between Protective Relays and Power System Signal Sources	Eric Udren
b. (if time allows)	No time for this presentation. Reschedule for January 2024. IEEE C37.104 IEEE Guide for Automatic Reclosing on AC Distribution and Transmission Lines	Manish Patel

VII. Old Business
VIII. New Business
IX. Announcements
X. Adjourn