



**POWER SYSTEM RELAYING AND CONTROL COMMITTEE
of the IEEE POWER AND ENERGY SOCIETY
MINUTES of the MEETING in Jacksonville, FL**

January 9-12, 2023, at IEEE/PES JTCM, Hybrid In-Person and Virtual Meeting

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 (EST) on Thursday, January 12, 2023.

In-person attendees followed the tradition of introducing themselves, but the introduction of the on-line attendees via webex was skipped. First time in person attendees reintroduced themselves and were recognized. A quorum check was conducted and verified that quorum was achieved (80 Main Committee Voting Members present, 53 in person and 27 on line, of 131 Main Committee Voting Members). Attendance was recorded via webex report and in-person check list. Attending this Main Committee meeting were 194 people (102 in person, 106 on line, 14 both) including 80 MC Members and 114 guests for a total attendance of 194.

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

We had 172 in person and 126 virtual participants for our January 2023 meeting in Jacksonville, FL including 32 newcomers including our colleagues from the Power System Communication and Cybersecurity (PSCC) Committee who we regularly meet jointly with. The break down in participants at this meeting is shown below. This meeting was organized by the PES as the Joint Technical Committee Meeting (JTCM). The JTCM is an opportunity for us to interact with other committees. The JTCM organizers do a fantastic job of taking care of our needs.

| Committee | Returning | New Attendees | In Person | Virtual | Total |
|------------------|------------------|----------------------|------------------|----------------|--------------|
| PSCC | 41 | 7 | 23 | 25 | 48 |
| PSRC | 225 | 25 | 149 | 101 | 250 |
| Total | 266 | 32 | 172 | 126 | 298 |

At this meeting I (Michael Thompson) took over the role of chair from Murty Yalla. Murty and Russ Patterson were the officers who I learned under in the journey to the Chair position and I am grateful for their help and guidance. The IEEE PES PSRC Committee is an important

organization with a history of excellence and I take very seriously the responsibility of leadership. It is an honor and I pledge to do my best. I want to welcome Jim Niemira to his new role as Secretary of the Committee and congratulate Gene Henneberg on his promotion to Vice Chair.

I want to thank all of the mentors who have guided me and continue to guide me. Phil Winston invited me to become a voting member of the PSRC Committee in 2006. I appreciate all of the advice that he has and continues to give me. Other mentors include Miriam Sanders, Charlie Henville, Bob Pettigrew, Pratap Mysore, and Mike McDonald. There are many others who have touched my life and career that I have not mentioned here, and I thank them too.

We welcomed the following contributors who have accepted Murty's invitation to join the PSRC Committee. We appreciate their dedication to this organization and look forward to many more years of contributions in the future.

| | | |
|----------------------|-------------------|----------------|
| Sabastian Billaut | Hilmon Ladner | Greg Ryan |
| Scott Cooper | Benjamin Kazimier | Eric Thibodeau |
| Evangelos Farantatos | Chase Lockart | |
| Derrick Haas | Todd Martin | |

It is with sadness that I report the passing of three long time contributors to the work of the PSRC Committee. Dennis Holstein, Stanley Horowitz, and Gerald Johnson. These engineers all had a significant impact on society by sharing their knowledge and skill in power system protection and control with the world. Having the opportunity to know and learn from these wonderful people is one of the things I cherish most about being part of this committee. We are grateful to them.

I see one of my most pressing and impactful challenges is to guide the committee into the post pandemic era. We will try things and adjust in the spirit of continuous improvement. In my long history with the committee, I have come to appreciate that one of the benefits of volunteering and contributing my time to the PSRC Committee is the opportunity to build connections to a wide variety of people who have different skills, experiences, and perspectives. What we learn from these interactions and connections impact the important work that we do and the better we do our work, the better it is for society. The current plan, as announced at the Main Committee meeting on January 12th, 2023, is to return to primarily in person meetings for two of our three full gatherings each year. Remote participation will continue during the many individual group meetings that happen between the three full committee gatherings. The JTCM in January is also planned to support hybrid meeting format with both virtual and in person participation.

Another important project that we will tackle this year is to get a new membership management system up and running. The PES has decided on Memberplanet for this system for all of the PES Technical Committees. This is a necessary tool to efficiently operate the committee. We hope to make quick progress to have this system available soon for administration of our activities. Look forward to an invitation to create your profile soon.

Thank you to all PSRC participants for making our January 2023 meeting a successful meeting. I wish you a blessed and happy new year and look forward to seeing you all in Las Vegas, NV for our May meeting.

II. Approval of Minutes / Financial Report: Jim Niemira

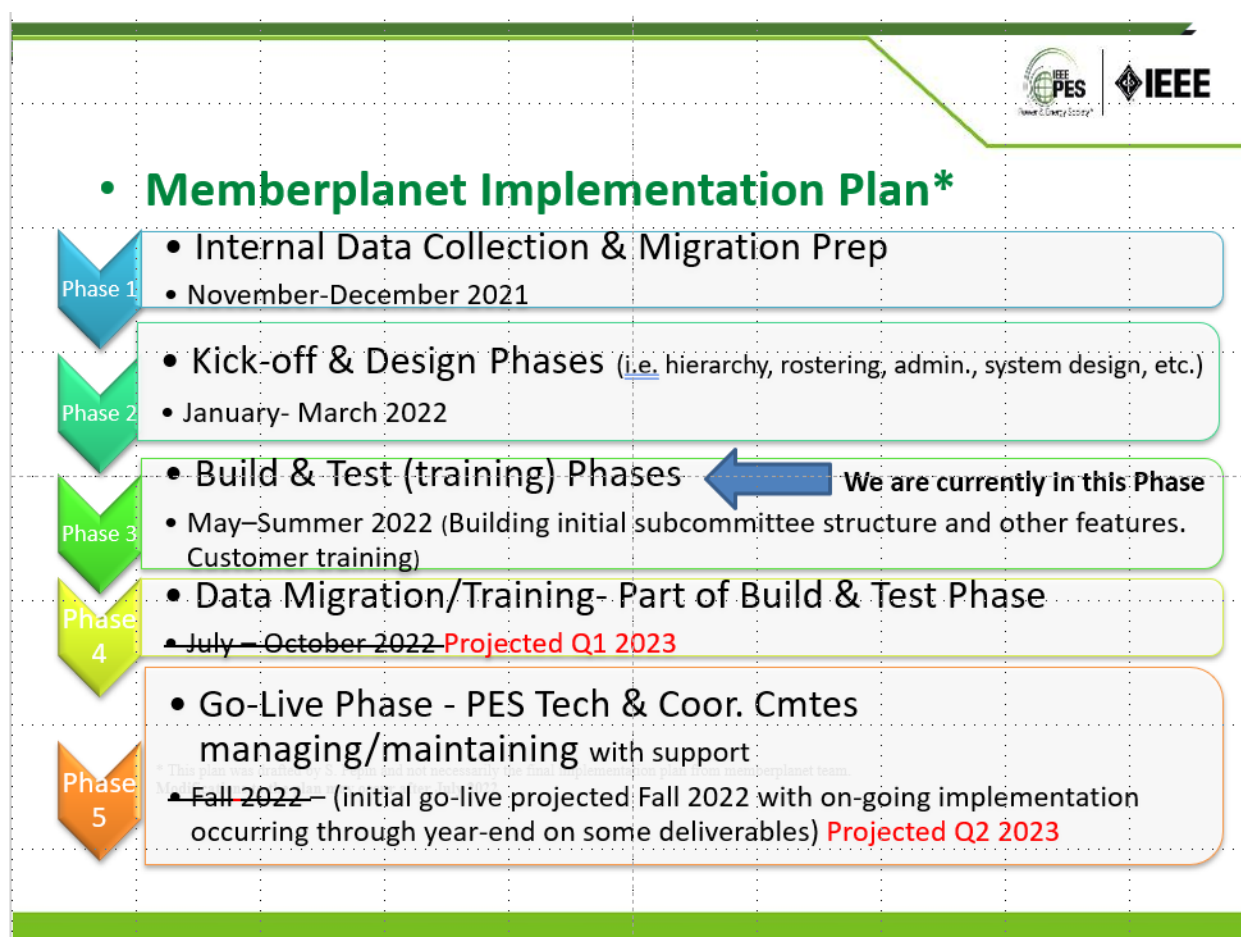
A motion to approve the minutes of the September 2023 hybrid meeting of the PSRC Committee was made and seconded (Adi Mulamwari and Alex Apostolov). The motion was approved unanimously.

In person registration for both PSCC and PSRC increased from September to January from 164 to 172, and total registration is down slightly from 348 to 298. Refer to the Chair's report for breakdown of attendance statistics.

The PSRC committee financial status is healthy. Expenses for the May 2022 meeting in Reno and the September 2022 meeting in Nashville were modest. The Nashville meeting ran a small, planned deficit. Expenses for the hybrid meetings have been more difficult to predict due primarily to the uncertainty of in-person attendance numbers. We will plan to provide support for the Awards Ceremony and Banquet at the May 2023 meeting in Las Vegas without increase of registration fees.

Association Management System Update – Gene Henneberg

New system to replace 123Signup Supplied by memberplanet



Next Steps

- Email will be sent to all Committee Members, Working Group Members, Task Force Members, etc. asking them to complete a new profile with their primary email address – Target date by end of February 2023
 - If you are in more than one PES Technical Committee, you will receive multiple invitations, HOWEVER YOU SHOULD CREATE ONLY ONE MEMBER PROFILE. All PES TC share the database; you will use the same Member Profile for ALL PES TC.
 - BE SURE to complete your Member Profile. If you do not complete a Member Profile, membership rosters will be incomplete.
- Committee Structure capability built by memberplanet
- Each Committee Chair (Admin) will be provided access to pull in existing member records via an email upload or via manual selection from existing member records

III. Reports of Interest

A. Technical Paper Coordinator's Report: Michael Thompson

- PES GM 2023 (In Person Meeting, July 16 to 20, Orlando, FL)
- 4 Panel sessions
 - Integrating Relay Models with RMS Dynamic Simulations – Protection Perspective, Evangelos Farantatos, Session Chair
 - Developing AI/ML applications for power system protection & control – Opportunities and Challenges, Yi Hu, Session Chair
 - Augmenting power system protection & control – Industry perspectives and case studies of practical AI/ML applications, Abder Elandalousi, Session Chair
 - New developments to mitigate power line induced wildfire ignitions, Jonathan Sykes, Session Chair
- 42 Papers Assigned
 - Requesting reviews be completed and returned by Tuesday, January 17, 2023 because they are due later that week

Technical Paper Reviewer Volunteers

A reminder for all Main Committee members. *Reviewing papers for IEEE Transactions and Conferences is one of the responsibilities of all Main Committee Members.*

Many thanks to the 66 volunteer Paper Reviewers:

| | | | |
|------------------|----------------|-------------------|----------------|
| Mark Adamiak | Steve Conrad | Rick Gamble | Bruce Mackie |
| Eric Allen | Ratan Das | Gene Henneberg | Vahid Madani |
| Abu Bapary | Brandon Davies | Michael Higginson | Bruce Magruder |
| Jeffrey Barsch | Alla Deronja | Ted Hlibka | Amir Makki |
| Tony Bell | Kevin Donahoe | Juergen Holbach | Ken Martin |
| Minum Bin Gani | Mike Dood | Ali Hooshyar | Peter McLaren |
| Joerg Blumschein | Paul Elkin | Richard Hunt | Rene Midance |
| Oscar Bolado | Will English | Tony Johnson | Dean Miller |
| Sukumar Brahma | Dale Finney | Kevin Jones | Bhaskar Mitra |
| Gustavo Brunello | Ken Fodero | Bogdan Kasztenny | Pratap Mysore |
| Ritwik Chowdhury | Fred Friend | Gary Kobet | Mukesh Nagpal |

| | | | |
|--|---|---|--|
| Jim O'Brien Dean Ouellette Manish Patel Mahendra Patel Russ Patterson Qun Qiu | Farnoosh Rahmatian Dan Sabin Veselin Skendzic Charlie Sufana Phil Tatro | Ian Tualla Steve Turner Eric Udren Benton Vandiver Ilia Voloh Michael Thompson | Don Ware Ted Warren Roger Whittaker Zhiying Zhang Karl Zimmerman |
|--|---|---|--|

PES Call for Webinars in 2023

- Submit a proposal by filling out a form, linked below.
- The focus of the webinar can be technical, professional development, or current issues/hot topics in the power industry
- Link to submit a proposal:
<https://app.smartsheet.com/b/form/127ee5dbb2044d62bd13bcbb02e5fe57>
- If you have any questions, please reach out to LaToya Gourdine: l.gourdine@ieee.org.

Future PSRC Meeting Plans

May 8-11, 2023, Las Vegas, NV, Flamingo Hotel and Casino
 September 18-21, 2023, Myrtle Beach, SC, DoubleTree Resort Myrtle Beach Oceanfront
 January 7-11, 2024, New Orleans, LA, Sheraton New Orleans
 May 11-18, 2024, Buffalo, NY, Hyatt Regency Buffalo Hotel and Conference Center

- Many PES TC have returned to face-to-face meetings exclusively for their Committee-wide meetings.
- PSRC Committee is returning to pre-pandemic face-to-face format for two of the three meetings per year.
 - May and September meetings will be face-to-face format
 - Individual Working Groups might provide for hybrid attendance, but it is up to the WG Chair to make the necessary arrangements.
 - JTCM, January meeting, will support hybrid meeting format

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

SC B5- Protection and Automation. The study committee met in Paris August 31, 2022 during CIGRE General Session. General information about the SC activities may be found at their website: <https://b5.cigre.org/>.

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

- Three new WG were voted for further Technical Council coordination and approval (tentative titles):
 - Obsolescence management for PACS
 - Education, Qualification and Continuing Professional Development of Engineers in Protection, Automation and Control
 - Protection Principles to be applied in Distribution Networks in the Future
- Each WG has a placeholder for a US representative, so if someone is interested in participating and is a CIGRE member, let me know and I will coordinate with John

McDonald, CIGRE USNC VP, Technical Activities, or contact John directly (johnD.mcdonald@ge.com)

- Preferential subjects for the next Paris meeting in 2024 are:
 - PS#1: Practical experiences and new developments of process bus
 - PS#2: Acceptance, commissioning, and field testing for protection, automation and control systems

Paper synopses deadline: June 30, 2023 (Due to John McDonald)

- CIGRE General Session 2024 Call for papers will be posted at: <https://www.cigre.org/GB/events/next-events>
- Recent Technical Reports:
 - B5.62 (TB 843): Life Cycle Testing of Synchrophasor Based Systems used for Protection, Monitoring and Control
 - B5.52 (TB 854): Analysis and comparison of fault location systems in AC power networks
 - Green Book: IEC 61850 Principles and Applications to Electric Power Systems
- Instead of regular SCB5 Colloquium, a Symposium in Cairns, Australia will take place 4-7 Sept 2023. Synopsys deadline has passed. Further details are at: <https://cigrecairns23.com.au/>
- Calendar of CIGRE Events in 2023 is posted at: https://www.cigre.org/GB/events/Calendar_gen.asp

Besides the events in Paris, the US National Committee is organizing a regular Grid of the Future conference. The last one was held Nov. 7-10, 2022 in Chicago. Further details are posted at: <https://cigre-usnc.org/grid-of-the-future-2022/>.

The next one will be held Oct 9-12, 2023 in Kansas City, MO. The paper deadline is July 28, 2023. 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. IEC Report for January 2023: Eric A. Udren

IEC Technical Committee 95, *Measuring relays and protection systems*

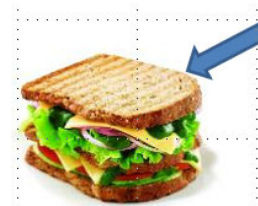
- Chair – Dr. Murty Yalla, US
- Secretary – Thierry Bardou, France
- 22 participating member nations

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 that hosts TAG reviews of IEC docs
- 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.

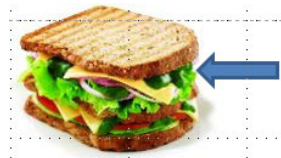


STANDARDS PROJECTS 1:

Three most important **relay product design and type test** standards newly revised with requirements including configuration of relays under test. International Standard final versions approved and to be published:

60255-1 Ed 2 - *Common Requirements* published; 60255-26 Ed 4 - *EMC requirements*, 60255-27 Ed 3 - *Safety requirements* published in weeks

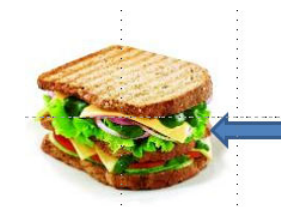
- 60255-21-1,2,3 – *Mechanical tests* – merged into one CD - mid 2023.
- These standards impact product designers and manufacturers.
- We set up PSRC WGs working on IEEE equivalents to align with IEC.
- Our IEEE–IEC alignment initiatives since 2000:
 - Align requirements – avoid conflicts.
 - Comparable 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*.



STANDARDS PROJECTS 2:

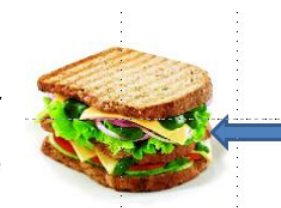
Functional and product performance standards:

- 60255-187-3 – *Functional standard for line differential relays* – Committee draft (CD) just available.
 - PSRC is restarting D34 to review and comment (Fischer).
 - **Technical review and inputs needed by end of April.**
 - 87L channel issues in separate project TS 60255-216-3.
- 60255-187-2 – *Functional standard for busbar differential relays* – work restarted.
- 60255-187-1 - *Differential protection of motors, generators and transformers* – a corrigendum proposed by Chinese NC is up for January vote.
- 60255-132 – Functional standard for directional power relays – *new project*, CD in 2023.
- 60255-167 - Functional standard for directional relays – *new project*, CD in 2023. Directional and directional overcurrent now included.



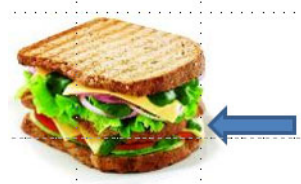
STANDARDS PROJECTS 3:

- 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.
- TS 60255-216-1 – *Digital Interface - Requirements for relays with digital I/O (e.g., merging units)* – Technical Report CD is cancelled and to be revised as a new CD for a technical standard with requirements.
- 60255-216-3 - *Digital Interface - Test specification for protection data communication of Line Current Differential Protection* – CD is beginning:
 - 87L Protection with TDM or Ethernet, e.g., T1 or MPLS. Specify tests to verify correct operation in support of 87L function during healthy or faulted 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).
 - Expert participants from US and Canada signing up.



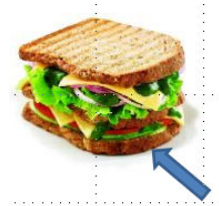
TC 95 2022 PLENARY MEETING:

- October 6 Virtual Meeting.
- Included delegations from participating TC 95 nations with US delegation of those involved in TC 95 standards developments and process.
- Minutes and presentations available for review.
 - Standards project status and program of work.
 - Maintenance team and working group reports.
 - Voting items including making 216-1 a technical specification.
 - Membership and participation review.
 - TC 95 leadership, project team leadership, and liaison updates.
 - IEC-level and horizontal activities reports.



TC 95 – PSRC COLLABORATION SUMMARY:

- US TAG comments in depth on TC 95 standards drafts.
- US has participants in TC 95 working groups and maintenance teams – **thanks to supportive employers.**
- US participants are supporting administrative work ongoing.
- PSRC WGs are established for each complex IEC standard project to evaluate drafts and to contribute to IEC content.
- PSRC product standard WGs are focused on alignment with IEC – especially test procedures for manufacturers
- Compliance with aligned international standards improve robustness, safety, and performance of products.



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

E. SC21 and IEEE 1547: Ben Kazimier

Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces

Sponsored by SC21 (formerly SCC21) now recently a full standards committee like PSRC and PSCC

For the 1547 revision, the PSRC is a joint-sponsor in a non-lead role.

1. PSRC Main Committee agreed to the Joint sponsorship in a non-lead role prior to the May 2022 meeting
2. At the May 2022 PSRC meeting a task force was formed under C subcommittee CTF49, for the purpose of determining how the PSRC sponsorship would interface with IEEE P1547 revision. It was determined that we would assign an official liaison.
 - a. CTF49 was disbanded upon approval of assignment of an official liaison
3. The long time PSRC K10 group for SCC21/1547 coordination was moved under the B subcommittee, now B11.
4. The liaison for the 1547 revision will report and coordinate through the B11 working group.
 - a. B11 will report back here at the main meeting including the 1547 revision updates

An official liaison has not yet been appointed. If interested to liaison - Please reach out to Benjamin Kazimier, Mat Garver (B11 Vice chair) or any of the PSRC officers.

IEEE 1547-2018 revision kicked off Monday Jan 9th and went ½ day.

Approximately 180 people attended between in-person and web

The meeting was mainly organizational

7 joint sponsors including PSRC and PSCC; 1 chair and 5 vice-chairs

*The PSRC had made an official request to have a protection subgroup - which was not formed for organizational reasons

So far 9 subgroups have been formed.

At least 5 of these have topics that could be related to protection.

There is also one task force for rotating machines.

1547 leadership is committed to hybrid meetings throughout the revision cycle.

Which means if you are interested in participating there is a potential to do so in-person or remotely

The first full 1547 revision meeting will be hybrid at Burns and McDonnell in Houston, TX, on April 3-6, 2023.

If you have an interest in participating in the revision work and subgroups please contact Benjamin Kazimier.

Lastly the meetings will be collocated with the new standard IEEE 1547.10:

Recommended Practice for Distributed Energy Resources (DER) Gateway Platforms

The PSCC is also a joint sponsor of this work.

F. Standards Coordinators Report: Don Lukach

WG and SC Chairs continue to do great processing PARs!

PSRC Standards

- 65 to 70 Standards

- 34 Active PARs

- 12 PARs due in 2023.

- 1 Entity with PSRC Lead

- 5 Joint Committee PARs with PSRC in non-Lead role

- More than 9 different organizations within IEEE and others outside such as IEC

Revised documents posted to PSRC website:

- SA P&P, WG P&P, Quorum Clarity Document, P&P Addendum

The O&P is under revision now. If you have comments or suggestions, please send to the Standards Coordinator.

- New revision will be based on PES Template

- All PES Technical Committees will have similar O&P, as was done with the P&Ps

Mandatory IEEE SA Training for all PSRC, Subcommittee, and WG officers:

- IEEE SA Standards Group Chair Fundamentals Training

- Understanding IEEE SA's Antitrust, Competition, and Commercial Terms Policies

- IEEE SA will be sending out reminder notices.

Discussion of the Entity Process for Standards. PSRC Membership is generally dissatisfied with the Entity Process for standards development. Members do not have the ability to participate in the development of the standards using the Entity Process. PSRC Members are volunteers who are individual industry experts representing their own expertise and opinions on technical matters and are not the designated representatives of other organizations. PSRC leadership will continue discussions with IEEE SA.

This report summarizes the status of PAR related projects as of the January 2023 meeting.

All PARs that needed actions were individually addressed before and during the PSRC meeting week.

New mandatory SA training for all applicable PSRC members is still being rolled out by IEEE SA. The original due date was 12/31/22 but an extension of 60 days is being provided. IEEE SA is notifying all affected individuals.

Main Committee PAR Submissions:

Please refer to the Subcommittee and Main Committee minutes for specific Subcommittee PAR motions.

Completed PAR projects in 2022:

| Project | Title |
|---------|--|
| C37.2 | Standard Electrical Power System Device Function Numbers, Acronyms, and Contact Designations |
| C37.104 | Guide for Automatic Reclosing on AC Distribution and Transmission Lines |
| C37.106 | Guide for Abnormal Frequency Protection for Power Generating Plants |

PAR Status

Tables of PAR Status are included in Addendum A of the PSRC Meeting Minutes. These include PAR Status, Joint Committee PAR projects that PSRC is in a Non-Lead Role, and All PSRC Lead Committee PAR Projects.

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

- PSCCC held 25 WG meetings, 4 subcommittee meetings
 - 48 registrants for PSCCC as primary committee
 - 7 newcomers
- C0 – New Vice-Chair, PSRC's own Ian Tualla
- E0 – Wireline met during JTCM, a first
- P0 – Protocols and Architecture will make a motion to become lead committee on IEEE 2030 (upon confirmation that SC21 will no longer be lead committee – change in AOR)
- S2 – IEEE P1711.1, Serial SCADA Protection Protocol (SSPP) Guide for using Secure SCADA Communications Protocol (SSCP) and Serial SCADA Protection Protocol
 - Will motion to form a ballot body for the standard
- S5 – PC37.240 Revision of IEEE C37.240 Cyber Security Requirements for Power System Automation, Protection and Control Systems
 - Will motion to transfer work to ISA99
- Thanks to PSRC officers & committee members for their support of & contributions to PSCCC!

H. J. NERC Report: Rich Bauer

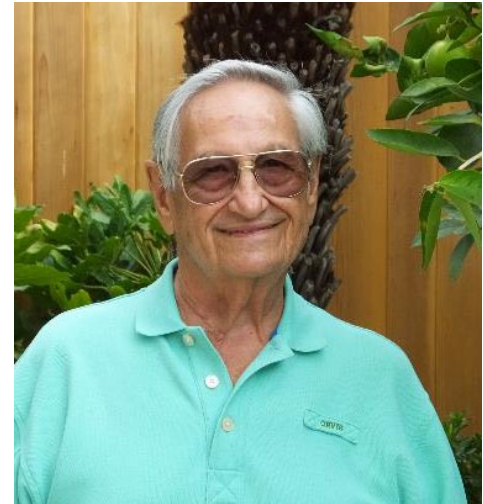
Nothing to report this time

I. Other Reports of Interest

Memorials:

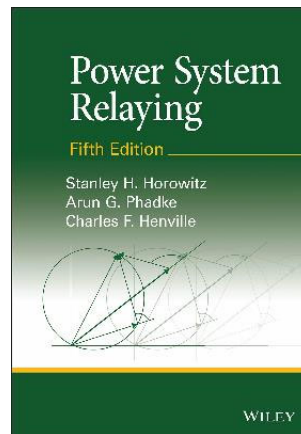
Dennis Holstein – August 31, 1935 to October 7, 2022

- Bachelor of Science degree at Iowa State University in 1957
- Master of Science degree from the University of Southern California in 1964.
- He pursued his dreams in aerodynamics as a wind tunnel test engineer at North American Aviation working on advanced airplane designs.
- He was later involved in work related to other military and space programs.
- He spent some time at Logicon Corporation in San Pedro, California as Manager of Advanced Systems.
- He returned to the Aerospace Corporation and in the 1990s under contract from EPRI began participating in UCA team meetings with a focus on Object Oriented Analysis and Design (OOD).
- Dennis later joined SRS Technologies in Newport Beach, California as Vice-President and General Manager of a new division.
- In 1999, he formed OPUS Consulting Group (OCG) with John Tengdin.
- Dennis was actively involved in IEEE PES and CIGRE working groups.
- In 2006 he received the CIGRE Technical Committee Award from SC B5 and in 2015 the CIGRE B5 Outstanding Service Award.
- PACWorld Guru December 2018



Stanley H. Horowitz – 1925 to November 2022

- PSRC Chair 1975-1978
- AEP (NYC & Columbus) 1950 – 1989
- System Protection Manager
- Assistant Head of Electrical Engineering Division
- Consulting Electrical Engineer
- CIGRE SC 34 Chair 1980-86
- PES Executive Board 1977-78
- 1979 PSRC Distinguished Service Award
- 2008 PES Lifetime Achievement Award
- Editor-in-Chief, PES CAP Magazine 1997-2002
- CIGRE Atwood Associates Award
- Designer of protection for AEP's new 765 kV transmission system.
- Drove AEP's early development of computer-based protective relaying deployments in 1970s.
- WAMS/synchrophasor pioneer
- Elected to National Academy of Engineering in 1995 "For contributions to electric power systems reliability and integrity through advanced protective relaying concepts."
- Co-authored standard textbook & reference, now new 5th Edition.
- PACWorld Guru November 2008



Gerald Farrell Johnson – May 28, 1949 to December 18, 2022

- Active in PSRC Committee for 14 years
- PSRC Liaison with the 1547 series of standards, Integration of DERs with the power system
- Recognized in 2016 PSRC Career Service Award
- 43 year career with Dominion Energy and Basler Electric

**J. Advisory Subcommittee Reports – Michael Thompson**

- The pes-psrc.org website has been updated with a clean new look
 - The PSRC Committee has three manuals that govern us
 - The Organization And Procedure Manual covers our committee and activities not governed by the IEEE Standards Association
 - The Policies and Procedures for Standards Development for the PSRC Standards Committee
 - The Policies and Procedures for Standards Development for the PSRC Standards Committee Working Groups
 - The two SA manuals are new and approved and posted on the knowledge base page
 - The PSRC Committee O&P Manual will be updated this year
 - **Lunch and Learn event held earlier this week:**
 - Understanding and Participating in the IEEE Transactions Publications Presented by Bogdan Kasztenny, Associate Editor of Transactions on Power Delivery (PWRD)
 - Apologies for failure of audio for remote participants
 - Slide deck will be posted on the knowledge base under presentations
- <https://www.pes-psrc.org/presentations>
- Please reach out to the PSRC associate editors and volunteer to review papers
 - Bogdan Kasztenny, Ali Hooshyar, Deepak Marigal

How to Become a Reviewer:

- You must be included in the ScholarOne (Manuscript Central) database:
 - You have published a Transactions paper or provided a review in the past
 - You have been invited to join
- To invite you, an Associate Editor needs your email address
- When invited, you set your password and enter basic information including area of expertise

Basic ScholarOne Functionality:

- Manage your invitations to review
- Access your assigned manuscript
- Perform reviews

- Contact IEEE administrators assigned to your manuscripts
- View instructions on how to use the system
- Update your email, address, areas of expertise, IEEE membership information
- Set “unavailable” dates

IV. Advisory Committee Reports:

B1: Awards and Technical Paper Recognition Working Group

Chair: Andre Uribe

Vice Chair: Mal Swanson

Secretary: Miguel Rios

WG Members:

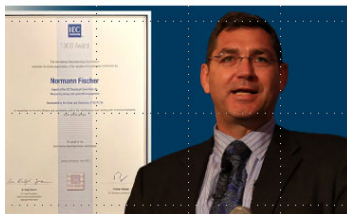
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| • Manish Patel | • Hugo Monterrubio | • Will English |
| • Alla Deronja | • Angelo Tempone | • Brandon Davies |

MANY THANKS to Past WG Chair Hugo Monterrubio!

Our next PSRC/PSCC Awards Ceremony will be Monday May 8, 2023, during our Monday Reception starting at 6:30PM at the Flamingo Hotel and Casino in Las Vegas.



CONGRATULATIONS!



The IEC Technical Committee

has awarded **Dr. Norman Fisher** the 2022 IEC 1906 Award for his expertise with the IEC TC 95, Measuring Relays and Protection Equipment. Thank you, Dr. Fischer, for your dedication and contributions to our industry!

PSRC Inductees to the US National Academy of Engineering

- **Murty V.V.S. Yalla**, For contributions to digital protection and control devices for the grid.
- **Mladen Kezunovic**, For contributions to automated analysis of power system faults, and leadership in education in protective relaying.
- **Solveig Ward**, For contributions to electric power system protective relaying, and new data communication technologies.



Standards WG Awards/Certificates

POP 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?

A: THE WORKING GROUP CHAIR OR VICE CHAIR

How do you initiate the request?

THROUGH THE IEEE SA AWARDS WEBSITE:

<http://standards.ieee.org/develop/awards/wgchair/wgawards.html>

- Awards can be shipped directly to the members with address provided or...
- Awards can be shipped to the hotel for presentation during our next meeting
 - Address to Ship Award:
 - Flamingo Hotel and Casino
 - 3555 S Las Vegas Blvd
 - Las Vegas, NV 89109
 - Include:

- c/o <Your Name Here> (Guest IEEE PSRC Meeting 5/8 ~ 5/11/2023)
- Cell: <Add your Cell #>
- Allow six weeks for processing
- Presentation Date: Monday May 8, 2023

Uncollected Awards:

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

Subcommittee Reports to Main Committee:

B2: Fellows Award Working Group

Chair: T.W. Cease

No report.

B3: Membership Working Group

Membership Activity Report, January 9, 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 January 9 hybrid meeting was 266, of which 150 were face-to-face and 116 were remote attendees.

12 attendees were in our Newcomers Orientation meeting on Tuesday morning, January 10, 2023. There were 7 in-person and 5 on-line attendees. Cathy Dalton sent emails in advance of this meeting, to those who had registered as first time attendees. She also sent follow up meeting emails to each newcomer, to support PSRC's 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 always 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

No formal report.

B9: Web Site Working Group

Chair: Rick Gamble

Website is revised and updated for ease of use.

B10: Inverter Based Resources Steering Working Group

Chair: Michael Thompson

WG B10 met on Wednesday, January 11th at 10:40AM. This meeting is by invitation only.

WG B10's assignment is to examine the challenges faced by the relaying and control industry presented by the conversion of the power system from conventional rotating machine based generation to inverter based resources and recommend projects to advance the state of engineering to address those challenges. The group also coordinates the activities of working groups that are formed to address those challenges.

Michael Thompson took over as Chair of the Working Group. The membership discussed whether the WG was still needed and what the membership should be made up of. The consensus was that the WG is still required and should continue. The current roster includes:

M. Thompson (Chair), A. Hooshyar, E. Farantatos, K. Jones, R. Bauer, M. Patel, M. Nagpal, G. Henneberg, A. Ang. Chairs of WGs that take up IBR related projects.

If anyone has items that they would like this coordinating working group to consider, please bring them to the attention of any of the members.

The WG discussed modeling IBR sources in fault study software and conducting fault studies using these models. Will it be possible to provide adequate tools to conduct fault studies without going to full time domain transient simulation? This is a question that will require much work in the future.

The WG discussed that IBRs do not fit well into the scope of our existing technical subcommittees. Will it be necessary to form a new SC and build a scope that focuses on engineering relating to IBRs at some time in the future? The WG decided that this is not necessary at this time.

No new projects were identified to be suggested to any of the SCs to consider at this meeting..

B11: SC21 Distributed Recourses Standard Coordination

Chair: Ben 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 Participants:

| <u>Name</u> | <u>Affiliation</u> | <u>Voting Status</u> (voting member, non-voting member, Participant) |
|-----------------|-----------------------------|---|
| Ben Kazimier | Bender | Chair |
| Mat Garver | Hubbell (Beckwith) | Vice-Chair |
| Wayne Stec | Distregen | Member |
| Brian Boysen | WE Energies | Participant |
| Fred Friend | Retired | Participant |
| Rudi Schubert | IEEE SA | Participant |
| Greg Ryan | Ameren | Member |
| Charles Sufana | Retired | Member |
| Gene Henneberg | NV Energy | Participant |
| Joseph Schaefer | FPL | Participant |
| Chip Christmann | Basler Electric | Participant |
| Steve Grier | Utility Systems Engineering | Participant |
| Mike Thompson | SEL Engineering Services | Participant |
| Philip Baker | | Participant |
| Steve Conrad | Retired | Member |
| Juan Gers | GERS USA | Member |
| | | |

Time called to Order and Chair's remarks: The meeting was called to order on Wednesday January 11, 2023, at 8:05am Eastern Time and introductions were made.

IEEE Policy Reminders (patents and copyrights): NA.

Confirm that call for Patent issues was made and record any responses: NA.

Topics discussed:

- Summary of P1547 Meeting held on Monday morning Jan. 9 2023
 - Ben gave a summary of the 1547 standard series
- P1547 guides and standards cover anything and everything that generates power into the distribution system. It is a Distribution Standard/guide.
- Differences between 2030 and P1547
 - 2030 is IT, communications, and interoperability
 - P1547 is concerned with the operation from a power system operation standpoint
- Covered the output and results of CTF49 at the Sept. 2022 meeting
- Covered what B11 Liaison will be responsible for, regarding P1547
 - Liaison will be responsible for collecting topics and concerns pertaining to protection from the various P1547 subgroups and bringing them to the attention of the PSRC

- Liaison will also take the responses and recommendations from the PSRC, regarding protection concerns, and provide them to the various P1547 sbgroups
- Wayne Stec covered details regarding 1547.2 and the change of SCC21 to SC21
- P1547 roadmap is to have 3 year revision cycles
- Discussed details regarding new 1547.10 and how it covers the DER Gateway
- Next 157 meeting will be in Houston, TX on April 3-6 2023
- Discussed the future planning of the 157 meetings
- It was determined/realized that the Liaison will have a lot of work to do and will probably need a team of folks to help with work load and attend 1547 subgroup meetings.

Action Items:

- Ben to put Details and descriptions that convey the scope and output of each of the 1547 Subgroups. This will go in the summary table slide that shows all the different subgroups.

Date, time, and location of next meeting: May 2023

Times of any recesses and time of final adjournment: Motion to adjourn at 8:50am, 2nd was made. Approved by all, meeting adjourned.

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

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

"C" Subcommittee Report – System Protection

Chair: Michael Higginson

Vice Chair: Manish Patel

Refer to C SC Minutes for complete report.

Met on January 11, 2023, and attained quorum; attendance figures will be in the C SC Minutes

No new members at this meeting

Special thank you to outgoing Chair Fred Friend for leadership of C Subcommittee

Congratulations to our new Vice Chair Manish Patel

Standards Projects Status Updates

C26: C37.233 Guide for Power System Protection Testing

Resolving ballot comments, expecting recirculation in March

C33: P2004 Recommended Practice for HIL Simulation Testing Power Apparatus & Control
Working on standard development

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

Resolving ballot comments

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

Pending SC review, seeking approval to go to SA ballot

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

New Task Force investigating interest in revising

Disbanded:

CTF34: Inverter-Based Short Circuit Current Impacts

New Task Force CTF52

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

Chair: Melvin Moncey Joseph

Vice Chair/Secretary: TBD

New Task Force CTF53

Assignment: Investigate the interest in establishing a new WG to develop a AI/ML data collection needs report and make a recommendation to C subcommittee whether a new WG should be established

Chair: Dan Sabin

Vice Chair/Secretary: TBD

Summary Papers for Subcommittee Review

C25: Protection of Wind Electric Plants (ongoing)

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

C48: C37.120 Guide for Protection System Redundancy for Power System Reliability

“D” Subcommittee Report – Line Protection

Chair: Meyer Kao

Vice Chair: Alla Deronja

Refer to D SC Minutes for complete report.

14 Active Working Groups, 3 are near completion.

“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 January 11, 2023, with 33 Members and number of guests. Quorum was established.

H SC currently has 18 active Working Groups (WGs) and one TF. 11 WGs are working on IEEE Standards and 7 WG are generating PES Technical Reports.

WG H6 completed Summary Report on “IEC 61850 Application Testing”, Chair: C. Sufana. It will be sent to HSC for approval this spring. The WG first met on March 11, 1999.

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.

WG H22 PC37.249 Guide for Categorizing Security Needs for Protection Related Data Files is in comment resolution in SA and has received a 1 year PAR extension. Chair: A, Makki

H SC approved the extension of **HT55** Investigate Distributed Cyber Physical Assessment for Grid Resilience. Met for the first time. Assignment: “Investigate Distributed Cyber Physical Assessment for Grid Resilience and evaluate participation with other technical committees, societies, groups and associations that may have interest.” Chair: J. Pack

HT55 first met in May 2022

Aaron Martin made a Motion, seconded by Mal Swanson:

Working Group H27 motions to submit Standard PC37.251, Standard for Common Protection and Control Settings or Configuration Data Format (COMSET), to IEEE-SA for Sponsor ballot. Motion was **APPROVED** without opposition.

"I" Subcommittee Report – Protection and Control Practices

Chair: Ritwik Chowdhury

Vice Chair: Angelo Tempone

Refer to I SC Minutes for complete report.

I SC met Wednesday, January 11, 2022, in a Hybrid meeting with 29 members—quorum was established. Complete attendance will be in the minutes.

Total 39 Voting Members

New members Gary Kobet, Hugo Monterrubio, and Zitao Wang

Retiring members Art Buanno, Jeff Long, Peter McLaren, and George Moskos

Approved I SC Minutes from September 2022

Presently 19 Active WG (1 New WG)

WG updates of note:

I32 – Survey relay test practices received 38 survey responses so far, only 27 of which are valid. Survey open until May 1st. WG is soliciting more responses—need 100 survey responses. Need help! Request those who work for utilities to help fill out survey. WG will begin analyzing results when more responses are received. PSRC Secretary please forward announcement from the WG Chair to the PSRC mailing list to request participation in the survey.

I35 completed their revision of IEEE C37.2, IEEE Standard for Electrical Power System Device Functions Numbers, Acronyms, and Contact Designations, and the Standard has been published. The WG will disband.

I29 – PC37.110 – Guide for Application of Current Transformers Used for Protective Relaying Purposes, and **I38** – PC37.92 – Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources, are both on January 30, 2023, RevCom Agenda!

I47 – Review and revise: IEEE C37.231-2006 - IEEE Recommended Practice for Microprocessor-Based Protection Equipment Firmware Control, the **WG feels a Standard is warranted**. Developing PAR for approval by PSRC MC. **PSCCC** is presently planned to be Joint Sponsor with **PSRC** continuing to be the Lead Sponsoring Committee.

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** will have a joint meeting starting May 2023.

I2 – Terminology Review, **Fred Friend** retiring, **Claire Patti** is new Vice Chair. **Benton Vandiver** is liaison with **PSCCC** and I2 helps review PSCCC definitions to improve coordination with PSRC

I26 – Report on Mathematical Models of Current, Voltage, and Coupling Capacitive Voltage Transformers, WG Ballot in progress. Working toward 75% response and approval.

I31, I36, I37, I40, I41 – IEEE C37.90.x and IEEE 1613: 1613, C37.90.2, C37.90.3 are working through the initial ballot comments and preparing for recirculation. SC approved 1 year PAR extension for 1613 to complete balloting process. C37.90 is working on getting to IEEE-SA Ballot; 2-year PAR extension received. Looking at definitions and working on WG comments received. C37.90.1 is making progress. Attempting to meet more often.

I33 – Report on Review of Relay Testing Terms, comments received in SC ballot have been addressed. Revised report will be resubmitted for SC ballot.

I48 – Review and revise C37.103-2015 – IEEE Guide for Differential and Polarizing Relay Circuit Testing, revision PAR on January 30, 2023, NesCom Agenda

I43 – Report on Response to USA executive order regarding EMP protection, expecting WG and SC Ballots next year

I46 – Review and revise: IEEE C57.13.3-2014 - IEEE Guide for Grounding of Instrument Transformer Secondary Circuits and Cases. SC approved submittal of PAR with no changes to Scope or Purpose.

I SC is looking for Liaisons for Sensors SC of the Power System Instrumentation and Measurements (**PSIM**) Committee and **Transformers Committee** —Will Knappek is retiring end of this year

I SC to vote on a Liaison role for **Entity WG** working on a PAR 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.

“K” Subcommittee Report – Substation Protection

Chair: Adi Mulawarman

Vice Chair: Brandon Davies

Refer to K SC Minutes for complete report.

Sebastien Billaut made a presentation to the K SC about power system inrush issues associated with inverter-based resources. A copy of the presentation slides will be forwarded for posting to Knowledge Base / Presentations page of the PSRC website.

VI. Presentation to the Main Committee:

Alla Deronja made a presentation on IEEE C37.234 Guide for Protective Relay Applications to Power System Buses, Revision 2021. Presentation slides will be posted to the Knowledge Base / Presentations page of the PSRC website

VII. Old Business:

No Old Business

VIII. New Business:

No New Business

IX. Announcements:

Next meeting will be face-to-face format at the Flamingo Hotel, Las Vegas, NV, in May 2023.

X. Adjourn:

Motion to Adjourn by Don Lukach; seconded by Brian Mugalian

Meeting adjourned 10:45 AM EST.

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

Addenda:

Addendum A: Standards Coordinator – PAR Status

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

Addendum A: Standards Coordinator – PAR Status**Completed PAR projects in 2022:**

| Project | Title |
|---------|--|
| C37.2 | Standard Electrical Power System Device Function Numbers, Acronyms, and Contact Designations |
| C37.104 | Guide for Automatic Reclosing on AC Distribution and Transmission Lines |
| C37.106 | Guide for Abnormal Frequency Protection for Power Generating Plants |

PAR Status

| PAR | Title | Expiration | Status | Chair | WG |
|----------|--|-------------|-------------------------------|------------------|-----|
| P1613 | Standard for Environmental and Testing Requirements for Devices with Communications Functions used with Electric Power Apparatus | 31 Dec 2023 | SA Ballot: Comment Resolution | Brian Mugalian | I31 |
| P1646 | Standard Communication Delivery Time Performance Requirements for Electric Power Substation Automation | 31 Dec 2023 | Draft Development | D Holstein | H41 |
| PC37.1.3 | Recommended Practice for Human Machine Interfaces (HMI) used with Electric Utility Automation Systems | 31 Dec 2023 | Draft Development | Matt Black | H46 |
| PC37.109 | Guide for the Protection of Shunt Reactors | 31 Dec 2023 | SA Ballot: Invitation | Kamal Garg | K26 |
| PC37.110 | Guide for the Application of Current Transformers Used for Protective Relaying Purposes | 31 Dec 2023 | RevCom Agenda(30 Jan 2023) | Joseph Valenzula | I29 |
| PC37.233 | Guide for Power System Protection Testing | 31 Dec 2023 | SA Ballot: Comment Resolution | Don Ware | C26 |
| PC37.249 | Guide for Categorizing Security Needs for Protection and Automation Related Data Files | 31 Dec 2023 | SA Ballot: Comment Resolution | Amir Makki | H22 |

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|-------------|---|-------------|-------------------------------|------------------|-----|
| PC37.251 | Standard for Common Protection and Control Settings or Configuration Data Format (COMSET) | 31 Dec 2023 | Draft Development | Mario Capuozzo | H27 |
| PC37.252 | Guide for Testing Automatic Voltage Control Systems in Regional Power Grids | 31 Dec 2023 | Draft Development | Xiaopeng Li | C39 |
| PC37.90.2 | Standard for Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers | 31 Dec 2023 | SA Ballot: Comment Resolution | Chase Lockhart | I36 |
| PC37.92 | Standard for Analog Inputs to Protective Relays From Electronic Voltage and Current Transducers | 31 Dec 2023 | RevCom Agenda(30 Jan 2023) | Ritwik Chowdhury | I38 |
| PC37.99 | Guide for the Protection of Shunt Capacitor Banks | 31 Dec 2023 | Draft Development | Rick Gamble | K25 |
| P2030.100.1 | Monitoring and Diagnostics of IEC 61850 Generic Object Oriented Status Event (GOOSE) and Sampled Values Based Systems | 31 Dec 2024 | Draft Development | Aaron Martin | H44 |
| P2030.12 | Guide for the Design of Microgrid Protection Systems | 31 Dec 2024 | SA Ballot: Comment Resolution | Mani Venkata | C38 |
| PC37.1.2 | Guide for Databases Used in Utility Automation Systems | 31 Dec 2024 | Draft Development | Theo Laughner | H40 |
| PC37.101 | Guide for Generator Ground Protection | 31 Dec 2024 | Draft Development | Ryan Carlson | J16 |
| PC37.102 | Guide for AC Generator Protection | 31 Dec 2024 | SA Ballot: Comment Resolution | Manish Das | J17 |
| PC37.113 | Guide for Protective Relay Applications to Transmission Lines | 31 Dec 2024 | Draft Development | Jeff Barsch | D42 |
| PC37.114 | Guide for Determining Fault Location on AC Transmission and Distribution Lines | 31 Dec 2024 | Draft Development | S Billaut | D44 |

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|-----------|--|-------------|-------------------------------|-----------------|-----|
| PC37.300 | Guide for Centralized Protection and Control (CPC) Systems within a Substation | 31 Dec 2024 | Draft Development | Ratan Das | H45 |
| PC37.90 | Standard for Relays, Relay Systems, and Control Devices used for Protection and Control of Electric Power Apparatus – General Requirements and Tests | 31 Dec 2024 | Draft Development | Marilyn Ramirez | I37 |
| 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 | 31 Dec 2024 | Draft Development | Roger Whittaker | I40 |
| PC37.90.3 | Standard Electrostatic Discharge Tests for Protective Relays | 31 Dec 2024 | SA Ballot: Comment Resolution | Steve Turner | I41 |
| PC37.95 | Guide for Protective Relaying of Utility-Consumer Interconnections | 31 Dec 2024 | Draft Development | Paul Elkin | K27 |
| PC37.232 | Standard for Common Format for Naming Time Sequence Data Files (COMNAME) | 31 Dec 2025 | Draft Development | Amir Makki | H52 |
| PC37.239 | Standard for Common Format for Event Data Exchange (COMFEDE) for Power Systems | 31 Dec 2025 | Draft Development | Mark Adamiak | H51 |
| PC37.243 | Guide for Application of Line Current Differential Protection Using Digital Communications | 31 Dec 2025 | Draft Development | Alla Deronja | D47 |
| PC37.96 | Guide for AC Motor Protection | 31 Dec 2025 | Draft Development | Zeeky Bukhala | J22 |

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|-----------|---|-------------|-----------------------------|----------------|-----|
| PC37.111 | IEEE/IEC International Standard - Measuring relays and protection equipment – Part 24: Common format for transient data exchange (COMTRADE) for power systems | 31 Dec 2026 | Draft Development | Mark Adamiak | H54 |
| PC37.119 | Guide for Breaker Failure Protection of Power Circuit Breakers | 31 Dec 2026 | Draft Development | Vahid Madani | K31 |
| PC57.13.3 | IEEE Guide for Grounding of Instrument Transformer Secondary Circuits and Cases | 31 Dec 2026 | Draft Development | Bruce Magruder | I46 |
| PC37.103 | IEEE Guide for Differential and Polarizing Relay Circuit Testing | TBD | NesCom Agenda (30 Jan 2023) | Mohit Sharma | I48 |

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

| Project Number | Committee | Co-Standards Committee | Project Title | Project Status |
|----------------|---------------------|--|---|-------------------|
| PC37.431.20 | PE/SUB/WGI9 | PE/PSRCC | Guide for Protecting Transmission Static Shunt Compensators | Draft Development |
| P1854 | PE/T&D/SDWG | PE/PSCC, PE/PSRCC | Guide for Smart Distribution Applications | Draft Development |
| 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 | Draft Development |

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|----------|---|---|---|----------------------|
| 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 | Draft Development |
| 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 | Draft Development |

All PSRC Lead Committee PAR Projects:

| Project Number | Committee | Co-Standards Committee | Project Title | Project Status |
|-------------------|-------------------------|---------------------------|---|----------------------|
| C37.247 | PE/PSRCC/C19_C37.247_WG | | Standard for Phasor Data Concentrators for Power Systems | Completed |
| C37.250 | PE/PSRCC/C21_PC37.250 | | Guide for Engineering, Implementation, and Management of System Integrity Protection Schemes | Completed |
| PC37.239 | PE/PSRCC/C239_WG | | Standard for Common Format for Event Data Exchange (COMFEDE) for Power Systems | Draft Development |

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|----------|-------------------------|--|--|-------------------------------|
| C37.120 | PE/PSRCC/C31 | | Protection System Redundancy for Power System Reliability | Completed |
| PC37.1.3 | PE/PSRCC/C37.1.3_WGH46 | | Recommended Practice for Human Machine Interfaces (HMIs) used with Electric Utility Automation Systems | Draft Development |
| C37.102 | PE/PSRCC/C37.102_WG-J17 | | Guide for AC Generator Protection | Completed |
| PC37.102 | PE/PSRCC/C37.102_WG-J17 | | Guide for AC Generator Protection | SA Ballot: Comment Resolution |
| C37.103 | PE/PSRCC/C37.103_WG | | Guide for Differential and Polarizing Relay Circuit Testing | Completed |
| PC37.103 | PE/PSRCC/C37.103_WG | | Guide for Differential and Polarizing Relay Circuit Testing | NesCom Agenda (30 Jan 2023) |
| C37.104 | PE/PSRCC/C37.104_WG | | Guide for Automatic Reclosing on AC Distribution and Transmission Lines | Completed |
| C37.106 | PE/PSRCC/C37.106_WG | | Guide for Abnormal Frequency Protection for Power Generating Plants | Completed |

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|----------|-------------------------|--|---|----------------------------|
| C37.108 | PE/PSRCC/C37.108_WG | | Guide for the Protection of Secondary Network Systems | Completed |
| C37.109 | PE/PSRCC/C37.109_WG | | Guide for the Protection of Shunt Reactors | Completed |
| PC37.110 | PE/PSRCC/C37.110_WG-I15 | | Guide for the Application of Current Transformers Used for Protective Relaying Purposes | RevCom Agenda(30 Jan 2023) |
| C37.111 | PE/PSRCC/C37.111_WG | | Standard for Common Format for Transient Data Exchange (COMTRADE) for Power Systems | Completed |
| C37.112 | PE/PSRCC/C37.112_WG | | Standard Inverse-Time Characteristic Equations for Overcurrent Relays | Completed |
| C37.113 | PE/PSRCC/C37.113_WG-D19 | | Guide for Protective Relay Applications to Transmission Lines | Completed |
| PC37.113 | PE/PSRCC/C37.113_WG-D42 | | Guide for Protective Relay Applications to Transmission Lines | Draft Development |

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|-------------|---------------------------|--|---|-------------------------------|
| C37.114 | PE/PSRCC/C37.114_WG | | Guide for Determining Fault Location on AC Transmission and Distribution Lines | Completed |
| 60255-118-1 | PE/PSRCC/C37.118.1_WG | | Measuring Relays and Protection Equipment - Part 118-1: Synchrophasor for Power System - Measurements | Completed |
| C37.119 | PE/PSRCC/C37.119_WG-K5 | | Guide for Breaker Failure Protection of Power Circuit Breakers | Completed |
| C37.230 | PE/PSRCC/C37.230_WG-D28 | | Guide for Protective Relay Applications to Distribution Lines | Completed |
| PC37.233 | PE/PSRCC/C37.233_WG | | Guide for Power System Protection Testing | SA Ballot: Comment Resolution |
| C37.235 | PE/PSRCC/C37.235_WG: I-30 | | Guide for the Application of Rogowski Coils Used for Protective Relaying Purposes | Completed |

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|---------|-------------------------|--------|--|-----------|
| C37.237 | PE/PSRCC/C37.237_WG-H3 | PE/SUB | Standard Requirements for Time Tags Created by Intelligent Electronic Devices - COMTAG(TM) | Completed |
| C37.241 | PE/PSRCC/C37.241_WG-I11 | | Guide for Application of Optical Instrument Transformers for Protective Relaying | Completed |
| C37.242 | PE/PSRCC/C37.242_WG | | Guide for Synchronization, Calibration, Testing, and Installation of Phasor Measurement Units (PMUs) for Power System Protection and Control | Completed |
| C37.243 | PE/PSRCC/C37.243_WG | | Guide for Application of Digital Line Current Differential Relays Using Digital Communication | Completed |
| C37.245 | PE/PSRCC/C37.245_WG | | Guide for the Application of Protective Relaying for Phase Shifting Transformers | Completed |

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|-----------|--------------------------|-----------|---|-------------------------------|
| C37.90.1 | PE/PSRCC/C37.90.1_WG | | Standard Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus | Completed |
| PC37.90.1 | PE/PSRCC/C37.90.1_WG | EMC/SDCom | 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 | Draft Development |
| PC37.90.2 | PE/PSRCC/C37.90.2_WG-I18 | EMC/SDCom | 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 | SA Ballot: Comment Resolution |

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|-----------|--------------------------|-----------|---|-------------------------------|
| C37.90.3 | PE/PSRCC/C37.90.3_WG-I41 | | Standard for Electrostatic Discharge Tests for Protective Relays | Completed |
| PC37.90.3 | PE/PSRCC/C37.90.3_WG-I41 | EMC/SDCom | Standard Electrostatic Discharge Tests for Protective Relays | SA Ballot: Comment Resolution |
| C37.91 | PE/PSRCC/C37.91_WG-K16 | | Guide for Protecting Power Transformers | Completed |
| PC37.95 | PE/PSRCC/C37.95 K27 WG | | Guide for Protective Relaying of Utility-Consumer Interconnections | Draft Development |
| C37.95 | PE/PSRCC/C37.95_WG | | Guide for Protective Relaying of Utility-Consumer Interconnections | Completed |
| C37.96 | PE/PSRCC/C37.96_WG-J10 | | Guide for AC Motor Protection | Completed |
| PC37.252 | PE/PSRCC/C39_PC37.252 | | Guide for Testing Automatic Voltage Control Systems in Regional Power Grids | Draft Development |

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|----------|--|---------|--|-------------------|
| C57.13.1 | PE/PSRCC/C57.13.1_WG | | Guide for Field Testing of Relaying Current Transformers | Completed |
| C57.13.3 | PE/PSRCC/C57.13.3_WG | | Guide for Grounding of Instrument Transformer Secondary Circuits and Cases | Completed |
| PC37.114 | PE/PSRCC/D44_PC37.114_Fault Locating Guide | | Guide for Determining Fault Location on AC Transmission and Distribution Lines | Draft Development |
| PC37.243 | PE/PSRCC/D47 PC37.243 | PE/PSCC | Guide for Application of Line Current Differential Protection Using Digital Communications | Draft Development |
| P1646 | PE/PSRCC/H/WGP1646 | | Standard Communication Delivery Time Performance Requirements for Electric Power Substation Automation | Draft Development |
| PC37.300 | PE/PSRCC/H45WG | | Guide for Centralized Protection and Control (CPC) Systems within a Substation | Draft Development |

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| PC37.111 | PE/PSRCC/H54 PC37.111 COMTRADE Dual Logo IEC | | International Standard - Measuring relays and protection equipment – Part 24: Common format for transient data exchange (COMTRADE) for power systems | Draft Development |
| PC37.90 | PE/PSRCC/I37 | | Standard for Relays, Relay Systems, and Control Devices used for Protection and Control of Electric Power Apparatus – General Requirements and Tests | Draft Development |
| PC37.92 | PE/PSRCC/I-38 | | Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources | RevCom Agenda(30 Jan 2023) |
| C37.231 | PE/PSRCC/I3-C37.231_WG | | Recommended Practice for Microprocessor- based Protection Equipment Firmware Control | Completed |

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|-------------|---------------------------------------|--|--|-------------------------------|
| PC37.101 | PE/PSRCC/J16 - Revision to C37.101 | | Guide for Generator Ground Protection | Draft Development |
| PC37.119 | PE/PSRCC/K31 PC37.119 BF Guide | | Guide for Power System Circuit Breaker Failure Protection | Draft Development |
| P2030.12 | PE/PSRCC/Microgrid Protection Systems | | Guide for the Design of Microgrid Protection Systems | SA Ballot: Comment Resolution |
| 2030.100 | PE/PSRCC/P2030.100 WG | | Recommended Practice for Implementing an IEC 61850 Based Substation Communications , Protection, Monitoring and Control System | Completed |
| P2030.100.1 | PE/PSRCC/P2030.100.1_WGH-44 | | Monitoring and Diagnostics of IEC 61850 Generic Object Oriented Status Event (GOOSE) and Sampled Values Based Systems | Draft Development |
| PC37.1.2 | PE/PSRCC/PC37.1.2 WG | | Guide for Databases Used in Utility Automation Systems | Draft Development |
| PC37.109 | PE/PSRCC/PC37.109 | | Guide for the Protection of Shunt Reactors | SA Ballot: Invitation |

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| PC37.232 | PE/PSRCC/PC37.232 WG H52 | | Standard for Common Format for Naming Time Sequence Data Files (COMNAME) | Draft Development |
| C37.234 | PE/PSRCC/PC37.234 | | Guide for Protective Relay Applications to Power System Buses | Completed |
| PC37.96 | PE/PSRCC/PC37.96 WG J22 | | Guide for AC Motor Protection | Draft Development |
| C37.99 | PE/PSRCC/PC37.99_WG-K8 | | Guide for the Protection of Shunt Capacitor Banks | Completed |
| C37.116 | PE/PSRCC/PE/PSR/C37.116 | | Guide for Protective Relay Application to Transmission- Line Series Capacitor Banks | Completed |
| C37.246 | PE/PSRCC/PSRC WG C18 | | Guide for Protection Systems of Transmission to Generation Interconnection s | Completed |
| PC57.13.3 | PE/PSRCC/WG I46 - PC57.13.3 Guide Inst Trf Sec Cir & Cases | | Guide for Grounding of Instrument Transformer Secondary Circuits and Cases | Draft Development |

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|----------|-------------------------------|--------|---|-------------------------------------|
| 2030.101 | PE/PSRCC/WG_P2030.101_H3 8 | | Guide for Designing a Time Synchronization System for Power Substations | Completed |
| C37.248 | PE/PSRCC/WGC37.248 | PE/SUB | Guide for Common Format for Naming Intelligent Electronic Devices (COMDEV) | Completed |
| PC37.249 | PE/PSRCC/WGH22 | | Guide for Categorizing Security Needs for Protection, Automation, and Control Related Data Files | SA Ballot: Comment Resolution |
| PC37.251 | PE/PSRCC/WG-H27_ | | Standard for Common Protection and Control Settings or Configuration Data Format (COMSET) | Draft Development |
| 1613.1 | PE/PSRCC/WGI31_P1613 | PE/T&D | Standard Environmental and Testing Requirements for Communications Networking Devices Installed in Transmission and Distribution Facilities | Completed |

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|---------|--------------------------------|-------------------|--|-------------------------------|
| P1613 | PE/PSRCC/WGI31_P1613 | PE/T&D, EMC/SDCom | Standard for Environmental and Testing Requirements for Devices with Communications Functions used with Electric Power Apparatus | SA Ballot: Comment Resolution |
| C37.2 | PE/PSRCC/WGI35_C37.2 | | Standard Electrical Power System Device Function Numbers, Acronyms, and Contact Designations | Completed |
| PC37.99 | PE/PSRCC/WG-K25 Cap Bank Guide | | Guide for the Protection of Shunt Capacitor Banks | Draft Development |

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

System Protection “C” Subcommittee of the PSRC

January 11, 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 January 11, 2023 at 4:15 PM Eastern Time in a hybrid meeting (both in person and via Webex).

In-person participants introduced themselves and indicated their affiliations. Online participants were displayed by the teleconferencing software tool. A quorum was achieved (37 out of 54 members and 44 guests).

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

The September 2022 minutes were reviewed. Fred Friend made a motion to approve the minutes, Gene Henneberg 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, January 20. 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.
- 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.
- Working group chairpersons are required to have IEEE PES and IEEE SA memberships.
- Registration for this meeting was about 267. There were 26 first time attendees.
- 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.
- There will be a new member management system (Member Planet) to be used starting in 2023. The Member Planet roll out is in progress but behind schedule and likely not ready for May meeting. 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. O&P is under revision. All PSRC participants are encouraged to review the revised documents and reach out to leadership if any questions arise.

- 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.
- 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.
- 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.
- All IEEE SA Working Group Chairs are required to take training. The training covers WG leadership, Antitrust, Competition, Commercial Terms, Conflicts of Interest, Sanctions, and International Trade. This is important training to ensure we conduct our working groups in line with laws and policies. Training is available online and takes a few hours.

Working Group Reports

The minutes of the Working Groups are attached.

Old Business

None.

New Business

The new task force to investigate interest in revising standard C37.246 IEEE Guide for Protection Systems of Transmission-to-Generation Interconnections, which expires in December 2027 was discussed. After brief discussion, Alla Deronja moved to create a task force to investigate interest in revising this standard. Fred Friend seconded the motion, and there was no opposition. A new task force CTF52 was formed. Melvin Moncey Joseph will chair the new task force.

The new task force was proposed by Yi Hu to investigate the interest in establishing a new WG for developing a report to document the current utility data collection and event labeling practice (through an industry survey) and the data needs in development, implementation, testing, and deployment of artificial intelligence/machine learning and other types of data analytics applications, and to make recommendations based on the gaps identified. After brief discussion, Yi Hu moved to create a task force. The motion was seconded by Adi Mulawarman, and there was no opposition. A new task force CTF53 was formed. Dan Sabin will chair the new task force.

The CTF34 has completed their work. The CTF34 voted to request C-SC to disband the working group. After brief discussion, Kevin Jones moved to disband the CTF34. The motion was seconded by Ritwik Chowdhury, and there was no opposition. The CTF34 was disbanded. Michael Higginson thanks members of the CTF34 for their contributions.

General Discussion

Michael Higginson noted following:

- Working Groups (WGs) C46 and C48 have developed summary papers per their assignment. These WGs are requesting the review and approval of C Subcommittee members.
- Working Group C39 is ready to go for IEEE-SA ballot for PC37.252 Guide for Testing Automatic Voltage Control Systems in Regional Power Grids. This is an entity standard. The WG is seeking the review and approval from C-Subcommittee to initiate IEEE SA balloting.

The above documents will be sent to C-Subcommittee members for review/vote soon after the meeting.

Adjourned

The subcommittee meeting adjourned at 5:45 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: - Liaison with NASPI (North American Synchrophasor Initiative) (specifically the PRSVTT) to keep the PSRC in sync with the changes and needs in the industry with respect to the development and usage of PMU devices. Formalize transfer process of PRSVTT developed documents to PES PSRC including making recommendations which PRSVTT activities should be transferred to IEEE reports, guides and standards. - Make recommendations to PSRC for assignments that would require the creation of working groups in PSRC and also recommend what the output of those working groups might be (Guides, reports, etc.) based on the needs of the industry. - Coordinate related activities with other IEEE PES committees.

Meeting Date and Time: Hybrid meeting, On January 10, 2023 at 3:40 pm EST

Attendance: 4 members out 14 attended. 5 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

- Overview of PMU related standards work was shown.
- IEEE PSRC ongoing PMU related activities were discussed and updated
 - Should inform DistTT about PSRC D45 work
- IEEE PSCC ongoing PMU related activities were discussed and updated
- NASPI past work and publications were discussed and updated
- NASPI current work was discussed and updated
 - PRSVTT: PMU PT/CT user survey needs more responses (only three responses received so far). Suggested to check PSRC if it can help to get more responses. Farnoosh Rahmatian to coordinate with Yi Hu to bring this request to PSRC
- NASPI upcoming webinars and next work group meeting date were announced.
- Old Business:
 - None: no new work items to be carried from NASPI to IEEE or vice versa
- New Business:
 - None

Adjourn at 4:50 EST

Upcoming PSRC/PSCCC and NASPI Meetings:

Next NASPI Work Group Meeting, April 12-14, 2023, Tempe, AZ

Next C23 meeting will be during PSRC/PSCCC meetings May 8 – 11, 2023, Las Vegas, NV

C25: Summary Paper and Presentation on Protection of Wind Electric Plants

Chair: Amin Zamani

Vice Chair: TBD

Output: Summary Paper

Expected Completion Date: December 2022

Version: 3.0

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 (**virtually** and in person) on Tuesday - January 10, 2023 at 08:00–09:10AM EST. There were total of 17 attendees in the meeting, 4 members and 13 guests.

Meeting Agenda

- Introductions
- Status Update (Sub-committed approval)
- Target conferences
- Adjourn

Summary of Meeting Discussion

- a) The meeting started with the introduction of all attendees.
- b) The chair provided an updated on the latest status of the summary paper. It was discussed that the paper is now with subcommittee members for review and approval. The comments are due by February 2, 2023.
- c) Upon the receipt of comments from the C-subcommittee, the goal is to finalize the comments by end of February (if not major).
- d) It was agreed that once the paper finalized, we will submit it for presentation to the following venues assuming someone will attend:
 - a. WPRC 2023 (Abstract due 03/20/2023)
 - b. Texas A&M 2024 (deadline TBD)
 - c. Georgia Tech 2024 (deadline TBD)
- e) It was decided to keep the next meeting in May to (i) address any potential major comments from the sub-committee and (ii) plan for presentation slides. It was also discussed that it might be needed to present the final presentations slides to the PSRC (maybe in September 2023).
- f) We will keep the WG open until the summary paper is fully approved.
- g) The meeting was adjourned at 8:30 AM EST.

For next meeting, we request a room for 30 people with a projector. Please avoid conflicts with C45, D43, C50, and D45.

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: extended PAR for finish by Dec. 2023

Draft: 5.41

Assignment: Revise C37.233-2008 Power System Protection Testing Guide

The Chair started off the meeting by reviewing the scope of the working group. Introductions of present participants made, quorum was achieved and the minutes from May & Sept 2022 were approved.

Number in attendance 27, 16 in-person, (7 members, 9 guests), 11 virtually (12 voting members).

Requisite slides displayed related to: copy write policy, IEEE patent slides, IEEE slides on participant behavior and code of conduct, and slides related to PAR word usage.

A PAR extension request to 12/31/23 has been granted. The WG acknowledges that it is of the utmost importance that we conclude this work this year so that we will avoid having to reinstate the PAR process all over again for this guide.

From the last meeting the subgroups were addressed:

- Status of section 1.6 and section 4 overhaul subgroup – work completed
- Status of graphics subgroup – This subgroup has concluded the lion's share of their work. Replacing illegible graphics with the newly produced replacements will be done forthcoming.

The bulk of the time of the meeting was dedicated to the topic of IEC 61850. As we had no one available to provide a detailed write-up as pertains to the testing aspect of 61850, the working group has elected to remove information expressly related to 61850. A note will be made in the general section of this guide to the effect of "see H6's report" and probably a few more reference documents.

Our earnest intent is to have this guide going through IEEE SA ballot recirculation by the beginning of March.

Next meeting: room for 40, avoid conflicts with D47, H45, H46, K31, and I45.

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: 1.09

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

Working Group C29 met in a hybrid session with 5-voting members, 2-non-voting members and 8-guests (15-total attendees) on Tuesday, January 10, 2023, 8:00-9:10 AM EST.

Kevin welcomed all attendees.

“Output” and “Assignment” are now aligned to both indicate Tutorial (it was decided at the September 2022 meeting that Tutorial was the best fit for C29’s intended objective).

Kevin reviewed the minutes, then asked if there were any comments on or objections to approving the minutes. Hearing none, the minutes from September 2022 were approved.

Kevin did some clean-up work on the draft document. The latest revision is now 1.09.

Kevin informed the working group that the section in the D29 tutorial on detailed setting examples, showing detailed calculations, is progressing well. He is currently working on a settings example for a power swing blocking function in an electromechanical relay, and then plans to do the same with a microprocessor relay. Following this, he then plans to test the microprocessor relay and document the testing methodology and results. He will insert this write-up into the relevant section of the C29 document.

Targets for the May 2023 meeting:

- Carry over of targets for the January 2023 meeting
 - 1) Section 1: Address comments (accept edits) and clean-up. Ratan agreed to undertake this, and then send to Jason for him to review.
 - 2) Sections 2 and 3: Address comments (accept edits), clean-up, and add any additional content. Mohit indicated that he, Scott and Deepak did already have a meeting. The originally assigned WG members as shown in the minutes of the September 2022 meeting to complete these tasks for the May 2023 meeting.
- Write-up of the test methodology of the settings example from D29.

The above tasks for the May 2023 meeting should be sent to Kevin and/or Mike by the end of April 2023.

Kevin did attempt to reach out to Mike Benitez. It appears Mike is in a different job, and so will possibly no longer contribute to C29.

Ratan suggested that the WG compile a survey, with objective to determine the depth to which calculations are made for power swing blocking settings, how often out of step tripping is applied, etc. Ratan will compile a draft before the May 2023 meeting so it can be discussed at that meeting. The thinking is that this will be a joint survey between C29 and D29.

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

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: D3

Assignment: Support the development of this IEEE recommended practice in cooperation with PELS, IAS, and IES efforts

Hybrid Virtual and In Person, Jacksonville FL, 11 January 2023, 08:00 – 09:10 EST.

The working group Chair, Vice-Chair and Secretary were present. The chair presided over the meeting and the secretary recorded minutes.

A call to order of the meeting was made with 16 attendees, 5 members, and 11 guests in attendance.

A quorum was achieved, minutes of the previous meeting were approved.

Patent slides were shown, and all participants asked to speak up about any patent claims at this time. The participant behavior slides were shown to all attendees. The patent slides are always available on the IEEE P2004 collaboration website for review.

The chair presented a summary of the work done resolving the writing assignments from the previous meeting. Several contributors to the writing assignments were absent; a meeting will be held in the future to address the outstanding comments.

Section B.5.3.18 on frequency protection will be removed as there is not content and it is too late to start adding content to this section.

A future web meeting TDB before the May meeting is planned.

Action Items:

Dean to follow up with Norman, Dale, Ritwik, Ali, Aaron, and Dinesh to address outstanding comments.

A section on ground faults needs some attention and the machine-modelling expert from RTDS will be contacted for help.

Aaron to review our references for consistency.

Dean will contact the chair of P2004 to ask about the time frame for having the C33 work ready to be submitted for comment.

Outstanding writing assignments: None

New Business:

Meeting was adjourned at 08:50 am EST.

CTF34: Inverter-Based Short Circuit Current Impacts**Chair:** Kevin W. Jones**Vice Chair:** Gary Kobet**Secretary:** N/A**Output:** N/A**Established Date:** September, 2017**Expected Completion Date:** January, 2023**Draft:** N/A

Assignment: Coordinate/communicate the efforts of the PES/NERC Low Short Circuit Current Impacts Task Force and PSRC working groups addressing the issues of inverter-based resources.

Working Group CTF34 met via WebEx in a single session with 10-voting members and 30-guests (40-total). (NOTE: Bob Cummings and Mike Jensen have retired, leaving the membership at 16.) The Chair presided over the meeting and the Vice-Chair recorded the minutes. The meeting was called to order by Kevin Jones on Wednesday, January 11, 2023 at 0800 EST. The minutes from the September 14, 2022 hybrid meeting were reviewed and approved.

The Chair reviewed action items for other PSRC working groups as noted in the document:

- C45 Protection and short-circuit modeling of systems with high penetration of inverter-based Resources – Manish Patel: Continuing C24 & C32, hope to finish late this year or early next year, had presentation from actual event reports from system faults.
- CTF51 - C37.117 may be revised/reestablished.
- D38 Impact of High SIR on Distance Relaying - Christopher Walker: No update (did not attend). Since a section has been added on IBR, no future reports needed.
- NERC – Rich Bauer – No update (did not attend). Will give report to Main Committee as usual (PRC-002, PRC-019, PRC-024)
 - PRC-019 (Jason Eruneo) - Industry ballot, 45 day review, 39% approval. Comments being incorporated, for re-balloting soon.

Since B10 (IBR Steering Committee) is established to coordinate this work, and C45 is the only remaining working group being monitored, and NERC makes a report to the PSRC Main Committee, it is proposed that this task force be disbanded. Jason Eruneo made the motion and Manish Patel seconded. Motion carried unanimously (10/16).

Chair Kevin Jones adjourned the meeting at 0910 EST.

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:** 1.4**Expected Completion Date:** September 2023**PAR Expiration Date:** December 2024**Guide Scope**

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

Guide Purpose

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

January 10, 2023 Meeting Minutes Hybrid Meeting

Officer Presiding: Michael Higginson

Minutes Prepared By: Michael Higginson

This meeting was a hybrid in-person (Jacksonville, FL) and online meeting (WebEx). It was chaired by Vice Chair Michael Higginson.

The meeting commenced at 9:20 AM EST. There were 57 attendees, with 15 voting members, 8 non-voting members, and 34 non-members. Quorum was met.

The working group began with introductory remarks by the Vice Chair. The agenda was reviewed. Ward Bower made a motion to approve the agenda, with a second from Sukumar Kamalasadan. 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 September 2022 meeting was reviewed. No comments were raised. Nirmal Nair made a motion to approve the September 2022 minutes, with a second from Ward Bower. The minutes were approved with no objections.

An update on the status of the Guide development was presented by the Vice Chair. The outline of the Guide was reviewed.

Since our last meeting, the Comment Resolution Group (CRG) established at the last working group meeting has been meeting every other week. The CRG has completed resolving approximately 70% of the ballot comments. To resolve comments, the CRG has been collaborating with both commenters and original section authors. After comments are resolved by the CRG, resolutions will be circulated with the WG for approval to recirculate for IEEE SA ballot.

The working group covered some of the comment resolution highlights. Guide sections that attracted many comments included clause 5.4 on effective grounding, clause 7.3 on centralized protection, and clause 9.3 on how power flow studies are used in the design of microgrid protection.

Finally, the working group discussed next steps for completion of our Guide. After comments have been resolved, the working group must approve recirculating for IEEE SA ballot. The IEEE SA recirculation ballot will follow working group approval.

Working group business for this meeting has been accomplished. Ward Bower made a motion to adjourn, seconded by Nirmal Nair. There was no opposition to adjourning. The meeting was adjourned at 10:30 AM EST.

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: 9/21/2021

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

Working group C40 did not meet at this meeting.

C41: Investigate performance requirements for Distribution PMUs

Chair: K. Martin

Vice Chair: N. Perera

Secretary: D. Gurusinghe

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 (hybrid) on Tuesday, January 10, 2023 at 10:40am (EDT) with 8 participants in-person and 11 participants via WebEx. Ken Martin (Chair) welcomed participants and briefed the objective of the WG, which is described in the assignment above.

Ken provided an overview of the progress of the WG up until now. Currently, our efforts have been on analyzing distribution system data to determine if the requirements or the measurement environment that might have different requirements than the current standard have. In order to achieve that objective, we've been working in sub-groups to find out what the requirements of applications that would be used on a distribution system.

Concerns were raised as to reporting coverage, data communication, and other system measurement needs. These concerns are mostly out of scope of the work as this work only concerns the phasor estimation itself, not the system where it is used. This work addresses accuracy, dynamic response, resistance to error due to interference. Allen highlighted this WG focused on measurement performances and rest of concerns are out of the scope.

Ken showed report/findings of Dahlia's report. He highlighted range of change of magnitude as an important parameter for the distribution systems. In reviewing Dahlia's report, some of the ROCOF was very high. This is probably an extreme or outlier value, we will have to look at the final report to see what the typical maximum rates are.

Abder mentioned that Southern California Edison (SCE) is looking for point-on-wave distribution measurements for their machine learning applications. They may need different type of measurement for some extreme events such as 3-phase faults. Ken mentioned measurements representing extreme events comprises higher levels of harmonics and it may hard to estimate phasor values.

In looking at the measurement applications, Farnoosh noted that for fault use applications the capability of measurement during faults a 2000% to 4000% of nominal range (20-40 times of nominal) is required. This may affect the low value measurement capability, though adaptive measurement systems are now frequently employed. Such limitations will be considered when writing the final report. Ken also suggested to WG members to look at the NASPI report "*Distribution Synchronized Measurements Roadmap Final Report*". Ken also requested WG members to think about new requirements that might go in a new standard.

Ken reminded our next WG meeting on some time in February.

Recorded by Ken Martin/Dinesh Gurusinghe

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

Chair: Yi Hu
Vice Chair: Adi Mulawarman
Secretary: Zheyuan Cheng

Established: January 2021
Completion: December 2022
Draft: 115

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 on January 11, 2023 with 30 attendees (9 voting members) – 18 in-person with 22 attended remotely. Yi Hu and Adi Mulawarman presided the meeting in-person. A round-the-table introduction of all attendees attended in-person was taken with online attendees to enter their name, affiliation, and email info in the chat window. Yi reviewed the WG C43 assignment at the start of the session.

Yi reported the status of the report: C subcommittee has reviewed and approved the report with some review comments for WG to address. Most comments are editorial in nature. WG Chair and Secretary are working on to address them. The redlined version will be reviewed by C subcommittee Chair and Vice Chair to ensure all comments have been properly addressed. When confirmed, the report will be sent to PSRC officers to obtain the final approval before submitting it to IEEE for publication.

The session proceeded with the continued discussions at last September's meeting regarding the next steps with the current report and plans after it is published. Yi mentioned the two options that the WG had been discussed: 1) disband the WG after the report is published and start a new TF to discuss whether a new WG should be established to revise the current report; and 2) Extend the WG finish date to produce an updated version if there are concrete items identified and have volunteers signed up to contribute to these items.

The session opened for discussion after Yi provided an overview of what have been covered in the current report:

- Regarding the need to collect data for AI/ML applications was discussed at the last September meeting and revisited again:
 - Some details will need to work out to start data collection (type of data, structure, etc.), and also who, and how to manage and where to store it (IEEE?).
 - A concern was raised with sharing the data in public forum as it may become an issue for people owning the data, particularly if system information needs to be shared.
 - There are a lot of good ideas on the data collection, and its importance in building the AI/ML models.
 - The data collection could have a more broad need by other technical committees – a joint effort is a possibility.
 - There are gaps that can be expanded into its own report. Maybe another report.
 - Suggestion to people interested in this topic to start a TF to gauge the broad interest on starting a WG for this topic
 - WG chairs will make a proposal to C subcommittee Chair as a new business item to discuss and vote on whether a new TF should be established at the subcommittee meeting – Note: The proposal has been approved by C subcommittee
- Regarding potential items to be added to the report after it is published:
 - Nirmal – Suggest to go for option 1) to start a TF to collect PAC use cases using ML and AI from users / utility internationally.
 - Current report lack use cases in control application (vs protection).
 - WG Chairs should list the topics that had been dropped in the current report due to lack of contributions for review and discussion at the next meeting.
- Panel sessions at IEEE PES General Meeting in July 2023
 - Two panel proposals based on the work of this WG have been accepted. One panel is still looking for 1-2 panelists. Contact Abder Elandalousi/Yi Hu for panel information if interested to be a panelist.

Meeting adjourned at 9:10 AM EST.

Next meeting: Single session to be held in conjunction with PSRC/PSCC May 2023 meeting. A room for 30 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

Vice Chair: Evangelos Farantatos

Output: Summary Paper

Established Date: May 2021

Expected Completion Date: January 2022

Draft: 10.0

Assignment: 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”

Working group C44 did not meet at this meeting. C44's paper was rejected by IEEE Transactions editors, which will need to be resolved.

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: 1.0

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 C45 WG met on January 10, 2022, at 10:40 AM EST. Members present 21. Quorum was not achieved. September 2022 meeting minutes were not approved. Those minutes will be sent to WG members for approval via electronic vote.

Chester Li from Hydro One Networks provided a very informative presentation focusing on event records of renewable resource responses to grid disturbances in Hydro One's system. The presentation was well received by members and guests in presence. The presentation is available at <https://psrc.sharefile.com/d-s681771156be24c949f60a866d031a17d>

Sherman Chan from ASPEN was planning to present concept of using DLLs for modeling converter-interfaced resources and type III wind plant in commercial short-circuit programs. However, Sherman was not able to join the WG meeting due to technical difficulties. Manish Patel summarized the approach that has been considered. More details may be provided in the next meeting. The presentation is available at <https://psrc.sharefile.com/d-s71d203dbfb744824915a4b909fa07b9b>

Ali Hooshyar reviewed the changes made in Section 2 of the draft report on standardized characteristics of IBR fault currents. This section is going to review the fault currents of grid-

forming inverters. Call of volunteers was made for group members to contribute to this new part of Section 2.

Manish Patel briefly summarized new material in Sections 3 and 4 and requested interested WG members to review. Call of volunteers was made for following topics: grid-following inverters and impact on frequency disturbances (for Section 3.1), IBRs and power swing (Section 3.2), critical clearing time for contingencies connecting two parts of the system (Section 3.3), and effect of IBR intermittency on short-circuit studies (Section 4.6).

Ritwik briefly summarized the new material in Sections 5 and 6 and requested interested participants to review. Call for volunteers made on several topics.

The latest C45 draft is available at <https://psrc.sharefile.com/d-s9aab46645cb7427dbd3979aec1b704ce>

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: N/A

PAR and PAR expiration: N/A

Established Date: 05/04/2021

Expected Completion Date: Sept 2023

Draft: 0.4.0

Assignment: Drafting of a summary paper of C37.242

Meeting Date and Time: Hybrid-Meeting, On Jan 13, 2023 at 09:20am EST

Attendance: 9 of 14 members (Quorum in attendance)
5 guests

Call to order

Officer presiding: Allen Goldstein

Officer recording minutes: Allen Goldstein

Quorum was reached.

Past Minutes: Previously approved via email

Call for Patents: N/A, WG guidance slide was shown

Summary of Activities and Discussions:

Writing a paper to describe the guide, using overleaf.

Draft 0.4.0 has been reviewed by the full working group.

Final comments were all addressed during the meeting.

WG voted to pass the draft to the C subcommittee

The bulk of the meeting was spent going over WG member comments on the draft.

Call for new business: None.

Meeting Adjourn at 10:15 am EST

Next meeting: May 8-11 Las Vegas, NV
Same time slot, Room for 30 people.

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 2024

Draft: 1.0

Assignment:

1) Contribute to the report of the Power System Dynamic Performance (PSDP) committee TF "Integrating Relay Models with RMS Dynamic Simulations".

CTF47 met on Tuesday January 11 2023 at 17:00 EST with 21 attendees, via the virtual online Webex as well as in person.

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

The chair reviewed the task force scope and provided an update received from PSDP TF on the status of the chapters of the report. He also informed all attendees that two panel sessions have been accepted for the 2023 PES GM conference to discuss the need and latest advancements in "Integrating Relay Models with RMS Dynamic Simulations". Then, Kevin Jones from Xcel Energy presented his work on "OOS and UFLS studies with PSS/CAPE – PSS/E TSLink." Several questions and discussions raised by attendees were answered by the presenter. Finally, chair encouraged attendees to volunteer to contribute to the PSDP task force report if they are interested.

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: May 2023

Draft: 2

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

WG C48 met on Tuesday, January 10, 2023, in a single session with 4 members and 15 guests attending.

Draft 1 of the document was sent to the members of the WG for review by the Chair in early November 2022. The received comments were incorporated, and Draft 2 was created.

At the meeting, the WG resolved a few comments received after the compilation of Draft 2. A couple of introductory statements will be added to precede the reference to voting schemes because they are not mentioned until the middle of the paper.

The WG approved the paper to be submitted to the Subcommittee C for approval. The intent is to have the paper reviewed by the subcommittee members before the PSRC May 2023 meeting, at which the WG would work on the comment resolution.

In parallel, we will start working on the presentation for the conferences and submit the paper abstract to the 2023 WPRC and MIPSYCON.

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

Please avoid conflicts with D42, D47, D37, K22, K31, and I2.

C50: Protection of Inverter-Based Resources

Chair: Brandon Davies

Vice Chair: Amin Zamani

Output: Report

Expected Completion Date: January 2025

Draft: TBD

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 (**virtually** and in person) on Tuesday – January 10, 2023 at 03:40–04:30PM EST. There was a total of 34 attendees in the meeting (24 virtual and 11 in-person).

Meeting Agenda

- Introductions
- Review of the TR87 topics
- Discuss proposals for new additions/changes
- Assignments
- General Discussion
- Adjourn

Summary of Meeting Discussion

- a) The meeting started with the introduction of in-person attendees. Since the online attendee list was available, no formal introduction was done for remote attendees.
- b) The chair invited attended who are interested in membership to contact either Chair (BDavies@TRCCompanies.com) or Vice Chair (AZamani@quanta-technology.com). 14 people shows interest in the meeting to become members.

- c) The chair discussed the scope of the work; it was explained that the plan is to expand the current TR and cover other types of IBRs.
- d) The focus of the work would be on large transmission connected IBRs. When needed, differences (and/or common practices) for protection distributed-connected IBRs will be explained.
- e) It was discussed that the focus is on the AC-side protection unless we have enough expertise in the team to cover the DC-side protection.
- f) The Chair shared some of the potential areas that requires modifications.
- g) Gustavo mentioned to include some high-level descriptions of IBR impacts on the transmission system protection, but the team agreed that C50 will focus on protection of the IBR plants (internal).
- h) Chair/V-Chair will contact members in the following weeks to discuss assignments.
- i) Since the revision of this TR also includes modification of the title, Michael/Manish will check with IEEE on the requirements/regulations.
- j) The meeting was adjourned at 4:45 PM EST.

For next meeting, we request a room for 30 people with a projector. Please avoid conflicts with C45, D43, C25, 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 met in a single session with 11 in-person attendees and 4 virtual attendees.

The meeting was started with introductions in the room and virtual.

The chair mentioned that the original guide is now inactive and that there was a task force formed to revise the guide, but it was decided then to not revise it. Bryan Boysen also affirmed to that since he was a part of the original TF.

The Chair informed the task force that since there is an increase of IBRs in the system, lower system inertia results, which yields higher Rate-of-Change-of-Frequency (RoCoF) for loss of large amounts of generation. Due to the higher RoCoF, more levels of UFLS may trip, resulting in a frequency overshoot that could result in generation tripping on over-frequency.

The Chair mentioned other blackouts that happened after the initial publication of the guide could be added. He also mentioned that the landscape has changed but there has been no changes in the way we perform UFLS.

Bracy Nesbit informed the group that ERCOT was close to having a blackout during winter storm Uri and that the voltage and frequency swings made the generations units more fragile. The Chair asked everyone who attended the meeting to go through the original guide and he said we could possibly decide whether we need to revise it or not in the next meeting in May.

The Chair talked about how they used rate of change of frequency supervision to prevent tripping on motor spin-down. Brian Boysen also mentioned they had used it as well.

The Chair mentioned the next blackout is around the corner and that we are behind the curve with respect to IBRs.

Michael Higginson and Bracy Nesbit also made some important observations.

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

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 (Jacksonville, FL) and virtually (via WebEX) on Wednesday, January 11, 2023, from 1:15 to 2:30 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 in-person attendees
- New Line Protection Subcommittee members: Bogdan Kasztenny
- The meeting was attended by 39 voting members and 54 guests, in person and virtual. Quorum was met.
- Minutes from the September 2022 meeting held in person and virtually were approved - motion made by Russ Patterson and seconded by Gustavo Brunello.
- Agenda for the D Subcommittee January 2023 meeting was approved - motion made by Joerg Blumschein and seconded by Gustavo Brunello.

The Chair reviewed items of interest from the Advisory Committee.

- WG Chairs: please send up to date minutes to Chair and VC by January 20, 2023
- Reminders:
 - Please use template
 - WG officers to update meeting attendance - keep records of newcomers who are not in the system
 - Template for Technical Reports (including Tutorials)
- PSRC web page WWW.pes-psrc.org
 - Rick Gamble is contact for D SC (Webmaster)
 - Refresh of web page is live, check it out!
 - A custom web page is available for each WG, if the WG Chair wishes to use it. Contact Rick Gamble, webmaster@pes-psrc.org
 - Website will have publicity page and plans to develop a page to honor long-term PSRC members who passed away. Fellows are also listed
- Recognized the need for a file share application for non-PAR WG's (<https://www.pespsrc.org/psrcsharefile.html>)
- WGs that complete their work are encouraged to present it to the IEEE community through WEBEX. Contact PSRC officers or Cathy Dalton (Publicity Chair) for further information
- WG Chair requires PES and IEEE SA membership
- Reminder to apply for Senior Membership in IEEE
- P&P Manuals have been approved. They are located under Knowledge Base section of PSRC website (<https://www.pes-psrc.org/knowledgebase/>)
- For each project development (PAR related) meeting show: Copyright, Patent Policies & New Participant Behavior Slides (<https://standards.ieee.org/about/policies/>)
- New mandatory SA training for Working Group Officers is specified from SA (PAR related WG) Due March 1, 2023 (was 12/31/2022, 60 days grace period extended)
 - It was noted that it is difficult to navigate to access the training, and the IEEE-SA was notified.
 - The WG chairs, vice-chairs, and secretaries are required to complete training.
 - The training for WG members is not necessary but may be beneficial.

- No grade for the training.
- Bogdan Kasztenny noted that IEC conducts a training for its members every 2 years to keep its members in good standing. The training is simple and does not require a lot of time to complete. This option may be considered in lieu of presenting the IEEE-SA slides at the IEEE-SA sponsored WG meetings that take time from meeting agendas.
- Plan is for the May and September PSRC meetings to be held in person only
- Next JTCM 2024 meeting will be hybrid
- PSRC will not object if a WG choose to hold hybrid meetings, but PSRC may not provide technical support (one or two meeting rooms with WebEx session and audio)
- PSRC Officers working with PES on new attendance and email system (Member Planet).
- Regardless of committee participations, everyone will only have a single profile under PES
- You will receive an email in a month or two to enter in your profile. PSRC will not create a profile for you. You may receive a few invites from more than one subcommittee but will need to create only one personal profile.
- Attendance 267 registered for the PSRC meetings (in person & virtual), 26 First Time Attendees
- Future Meetings (Subject to Change)
 - May 2023 – Las Vegas, NV
 - September 2023 – Myrtle Beach, SC
 - January 2024 – New Orleans, LA
 - May 2024 – Buffalo, NY
 - September 2024 – St Louis, MO

IEEE Standards Documents currently involved with WGs in 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 |

Working groups gave reports on their activity.

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

Chair: Kevin W. Jones

Vice Chair: Normann Fischer

Secretary: N/A

Output: Tutorial

Established Date: May, 2014

Expected Completion Date: May, 2024

Draft: 1.09

Assignment: Create a tutorial on setting impedance-based power swing blocking and out-of-step tripping functions related to transmission line applications. Specific relay settings examples will be provided. Other methods of detecting out-of-step conditions that exist will be summarized and referenced but will not be discussed in detail.

Attendees: 9-Voting Members, 2-Non-Voting Members, 23-Guest (34-total)

- 1.) The following members Josh Perkins, Gary Schroeder, Abu Bapary, Theresa Bowie, and Abel Gonzales are still in the process of reviewing the tutorial and will provide feedback before the May meeting.
- 2.) The chair reviewed the tutorial since the September meeting and has addressed some of the comments made by previous reviewers, he briefly mentioned some of these.
- 3.) The detailed power swing settings examples in the tutorial are being modeled and studied using two commercially available software packages namely ASPEN (Melvin) and CAPE (Chair).
- 4.) The chair added extra setting examples in section 8.
- 5.) The guide will also address out of step tripping for both tripping on the way in (TOWI) and the way out (TOWO). The vice chair to speak to the setting department at PG&E and discuss their setting philosophy regarding TOWI.
- 6.) The chair brought up the issue of doing a survey regarding how OOS (blocking and tripping) are implemented at different utilities to get an idea who will use the tutorial. Ajmal Saeed from PG&E will reach out to PG&E planning department to get their setting Philosophy. The Chair will reach out to some Texas utilities such as ONCOR to get their philosophy. Gene Henneberg will provide NV energy a brief write up regarding NV Energy's OOS philosophy.
- 7.) The Chair adjourned the meeting.

Requirements for the next meeting:

A projector and a room for approximately 30 people.

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: Sep 2022

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 held a hybrid in person in Jacksonville FL and online at 10:40 AM EST on January 11, 2023 with a total of 29 attendees, including 18 in person and 11 online. 10 of 16 voting members were in attendance, so a quorum was established.

In a ballot held in early 2022, Draft 8.0 was approved by the working group, with 13 approvals out of 16 voting members. Several ballots were approved with comments. All comments were reviewed and resolved. This included making some corrections to figures, re-ordering the summary table and some editorial improvements.

The Working Group chair will submit the report to the D Subcommittee for approval.

The report is quite comprehensive, including:

- Fundamentals of ground mho and quadrilateral element designs.
- A section of the effect of Z0 mutual coupling on ground distance elements, with different configurations.
- A discussion of quadrilateral polarizing methods, and their impact.
- A section on the impact of fault selection logic.
- The impact of line taps, including Z0 sources like an autotransformer.

Meeting was adjourned.

Assuming the balloting is completed in time, we propose a single session for 30 attendees for May 2023 with computer projector.

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

Chair: Normann Fischer

Vice Chair: Joe Mooney

Secretary: N/A

Output: Standard

Established Date: 2014

Expected Completion Date: 2024

Draft: 1.09

Assignment: Review and provide comments on behalf of the PSRC on the crafting of IEC 60255-187-3

Attendees: 3 in person and 3 virtual.

- The Chair opened the meeting and briefed the attendees to the purpose of this working Group. (This working group was put on hold for approximately 4 years to enable the IEC to get the document into a reviewable format).
- The chair asked for volunteers to help review the CD draft of the above document. All parties within the PSRC that want to review document should please contact the chair via email, and he will supply them with the latest CD of -187-3 and a comment sheet.
- Comments to be sent back to the chair by the 1st week in April.

For next meeting Room for 15 people and 1 overhead projector.

D35: Evaluation of Transmission Line Pilot Protection Schemes

Chair: Rick Gamble

Vice Chair: Brandon Lewey

Established: January 2017

Output: Technical report to the Line Protection Subcommittee

Assignment: Prepare a technical report to the line protection subcommittee to evaluate advantages and disadvantages of common transmission line pilot protection schemes, including POTT, DCB, DCUB, and line current differential. The schemes will be evaluated in terms of speed, sensitivity, dependability and security based on the design and configuration of transmission lines and system topology. A limited number of example systems will be evaluated.

Expected Completion date: 09/2023

Draft: Final Draft 3

Working Group D35 met on Tuesday, January 10, 2023 at 8:00am in person and remotely via WebEx with 20 members and 25 guests.

Introductions were made.

The WG discussed final document review and projected schedule.

Final Draft 4 will be distributed to working group members for review and next meeting will vote on submitting to SA Editorial for review.

The WG decided not to include a summary table to the appendix of the report.

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

Action Items:

- WG to review final report

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: 1.10

Assignment: Write a report on Impact of Series Compensation on Transmission Line Protection.

D37 met on January 10th 2:20pm EST with 23 people in attendance. The review and writing assignments were reviewed and the action item list updated.

Updated plan to complete the report was discussed.

Section 3, 4, 5 – Final Review by Nuwan and Mike

Section 6 – Melvin by end of March after which Sajal will do a final review

The chair emphasized that we are trying to get the report done by 2024 May.

A discussion was held regarding Single Pole Tripping and Phase Segregated Bypass in section 3.1 and it was decided that Norman will write about it and send it to Dean and Charles for review in late April.

For the next meeting, we request a room for 25 people, single session, with a computer projector. Please avoid conflicts with C29, C41, C48, D29, D42, D47, J18, 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 2024

Draft: 0.6

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 – Pratap Mysore second – Abu Bapary
4. Discuss status and progress of report
5. Presentation – Bogdan Kasztenny
6. Review writing assignments
7. Discussion of next steps
8. Adjourn

Minutes:

31 Attendees. 18 Members & 13 Guests

The task force from the previous meeting met a few times and has edited our report. Bogdan presented to the working group and we had a good discussion during the meeting. The current draft, a full write up on the method Bogdan presented and the presentation slides will be sent out to the working group. The working group is to review the document and be prepared to discuss during the May meeting where we will start the process of finalizing our report. Chris Walker is going to work with Jeff Barsch to advise the D42 WG for the transmission line guide on updates to the guide.

Next meeting a room for 40. Please avoid conflicts with D42, D43 and K25

D42: Revise IEEE Std C37.113-2015, IEEE Guide for Protective Relay Applications to Transmission Lines
Minutes for the 01/10/2023 meeting from 1:00 to 2:10 PM EST

Chair: Jeffrey Barsch

Vice Chair: Rick Gamble

Secretary: Josh Lamb

Output: Guide

Established Date: 5/5/2020

Expected Completion Date: 2024

Draft: 1.10

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 21 of 38 voting members
- f) Approval of Agenda (motion and second) – Don Lukach 1st, Rick Gamble 2nd.
- g) Approval of Minutes of previous meetings (motion and second) – Don Lukach 1st, Alla Deronja 2nd.
- h) Brief summary of discussions and conclusions including any motions.
 - a. Current Draft Comments were discussed starting on section 6.2.4.2 through 6.2.4.4
- i) Action item:
 - a. Ritwik Chowdhury to provide a write up to discuss Zone 2 coordination with Instantaneous elements in Section 6.2.4.2 2nd paragraph.
 - b. Jeff Barsch and Rick Gamble to convert the Guide to the new SA Style template.
 - c. Ritwik Chowdhury, Don Lukach, and Mat Garver will work to remove "should", "shalls", etc. and help to clean up the Guide.
- j) Recesses and time of final adjournment: Adjourned by Jeff Barsch at 2:12 PM EST.
- k) Next meeting date and location at: Online meetings to be held on the first Thursday of each month from 11:00-12:30 ET via Teams; next in-person meeting to be in May 2023.

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: January 2023

Draft: 0.5

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 and virtually on January 11, 2023 at 09:20-10:30AM EST. There were total of 20 attendees (9 online and 11 in-person) in the meeting, 8 members and 12 guests.

Meeting Agenda

- 1) Introductions/sign-up sheet
- 2) Review Working Group Membership and Membership Process
- 3) Discuss status and assignment of report
- 4) Discuss updates to report
- 5) Discussion of next steps
- 6) Adjourn

Summary of Meeting Discussion

- a) Meeting started with the Chair, Vice Chair, and Secretary introducing themselves. In-person attendees also introduced themselves.
- b) The Chair explained the requirements for membership, which is attending 2 out of the last 4 meetings.
- c) The Chair provided an update on the status of the report. Juan to provide his contribution in 2 weeks (01/30/2023)
 - a. System reconfiguration, Microgrid, and IBR-based systems
 - b. Adaptive protection
- d) An online meeting will be scheduled for mid-February. The intention is to have the document ready for final review and approval at the May PSRC meeting.
- e) All outstanding comments were reviewed and addressed.
- f) Don Lukach suggested removing the detailed bullet points in the maintenance section as too detailed and not applicable.
- g) It was discussed that the impact on reliability indices is not the focus of this report
- h) Colleen's comments on Annex B on removing this historical section were approved, which includes removing reference #20 in the bibliography. However, there was a conclusion and summary section that has value. A new Summary section will be created; Ryan to incorporate the conclusions.
- i) Don Lukach volunteered to review the entire document for 'bad words' like should/shall/etc.
- j) Ryan will post the latest document with today's edits to the Sharefile site.

For next meeting, we request a room for 30 people with a projector and please avoid conflicts with D38, 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 January 10, 2023, at 3:40 PM ET, Face-to-face and virtual online with 34 attendees.

12 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 and Secretary Looja Tuladhar recorded minutes.

The WG **voted to approve PSRC May 2022 and September 2022 WG meeting minutes**. Bruce Mackie motioned to approve, Amir Makki seconded, and there was no opposition.

- The group discussed creating a review team to review the guide and meet on a more frequent basis via webex. The following individuals volunteered to be part of this team: Sebastien Billaut, Looja Tuladhar, Ian Tualla, Yu Liu, Daniel Sabin, Karl Zimmerman, Steve Klecker, Steve Turner, Swagata Das, Peiman Dadkhah, Mohammad Zadeh, Arun Shrestha
- Looja Tuladhar gave an update that there are 41 figures within the guide that need to be reviewed and possibly redrawn. A smaller group of 5 members agreed to meet on a more frequent basis to be part of this review team: Sebastien Billaut, Looja Tuladhar, Karl Zimmerman, Peiman Dadkhah, Muhammad Hamid.
- Don Ware commented that the figures should comply to the IEEE style requirements, in terms of color, font size, and to check copyright permissions. Malia Zaman of IEEE offered assistance on copyright issues.
- Steve Klecker discussed the possibility of adding references to the guide of new or emerging techniques. At this time, the WG decided not to include the new references.
- Yu Liu suggested expanding Section 7.2 to include updated references. The review team agreed to include this suggestion as part of the overall review process.
- The WG Chair showed a time line of activities and the plan is to complete reviews and comment resolution **to take the draft to a ballot before the end of 2023**.

Yu Liu and Swagata Das motioned to adjourn the meeting, and the meeting was adjourned.

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 - Bruce has agreed to help with the secretarial work.

Output: Technical Paper

Established Date: September 2020 (1st task force meeting)

Expected Completion Date: Sep 2023 (under an aggressive schedule)

Draft: No overall draft, sections are ready for circulation and comment

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

D45 WG met on 1/10/23 at 2:20pm (Eastern USA Time) Members = 39 listed

Attendance = ~50, Quorum Established (approximately 20 people met face-to-face)

Jonathan opened the meeting with the agenda. The team reviewed the minutes from the last WG and approved the minutes (Approved). We reviewed the scope, assignments, discussed open topics. The team went through the various sections by having the leads of each section discuss their progress. No new items were included and 7 of 9 each section leads have submitted drafts and 2 section leads Scott, Eric) indicated

that they will submit their section soon.

Volunteers were received to provide panel on wildfire mitigation at the IEEE PES General meeting in- Orlando (Nirmal, Jeff, Dan, Jonathan, Hugh, Yanfeng, Daqing, Abu). The Chair and Vice-Chair will assign 4 volunteers to be on the panel.

Draft – no overall draft yet but 7/9 sections have drafts. A discussion occurred concerning the next steps on combining the sections into the first draft. It was decided to have a small group including Jonathan and Scott to combine the sections and provide an initial draft. The draft will be submitted for ballot by the WG.

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: 4.0

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 25 voting members, 3 non-voting members, and 15 guests on Wednesday, January 11, 2023, at the IEEE JTCM 2023 meeting. Two guests joined the WG as voting members and other two as 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: Gustavo Brunello, 2nd: Taylor Raffield. There were no objections.

The quorum was met, so the WG voted to approve the 2022 PSRC September 13, September 29, October 27, November 17, and December 15 webex meeting minutes. Motion: Don Ware, 2nd: Alexis Mezco.

A question was raised whether docx. files can be sent instead of docm. files because there are issues with company policies, and it is deemed a security risk. It was decided to upload both files to the iMeet Central.

The Chair asked the WG whether we should start having biweekly webex meetings. The PAR expires in December of 2025, the document needs to be internally balloted next year, and there are still many comments to resolve. A concern was raised that it is too early to have them biweekly and because of other workload. It was decided to have monthly meetings until the next May 2023 PSRC meeting and then revisit at the meeting in May.

The Chair stated that the present phase of the project is the resolution of the comments received from the guide content reviews by the WG members. Clause 6 is being restructured and extended, so there is a lot of

new material that will need to be reviewed.

A discussion was held regarding the Guide's revised title since the digital relay definition appeared too general, and, therefore, it was proposed at one of the fall 2022 webex meetings to use the microprocessor-based relay term in the guide. This term comes from C37.91 Guide for Power Transformer Protection. The WG members feel that the revised title in the approved PAR is fine and no change to it is needed. The chair opened a discussion on a definition for the line current differential protection function that will be included in the guide. The preliminary version of this definition was created at one of the fall 2022 webex meetings. The main objection was the word "data" in the definition as being too general. Other options like "current", "current measurements", or "current phasor measurements" were proposed instead that seem too specific. A more general definition could be referenced by other standards while a more specific definition would specify a function more precisely. A suggestion was made to remove that part of the definition.

A motion to approve the definition as shown was made by Don Ware and 2nded by Gustavo Brunello, and it was approved by all the voting members in attendance.

line current differential protection function: a function that detects faults on a line by measuring the differences between the currents at the line terminals using a communications channel.

The final version will be presented to WG I2 for terminology review for their approval.

A proposal was made to add an internal fault symbol to Figure 1 depicting a basic arrangement for the line current differential scheme, but it was decided to leave it as is.

A commenter proposed to extend 5.2.3 *Charge comparison operating principle* because the sub-clause is short and does not offer details on this protection method. A motion was made to not extend it as this method may be obsolete. One person indicated that it is still in use by a relay manufacturer and is not intended for retirement. If a contribution is made to offer additional material to the sub-clause, it will be included.

Action Item:

Joerg Blumschein will review 5.2.3 *Charge comparison operating principle* to explain the tolerance of +/- 4ms, +/-3ms variation in channel delay (an optional graphical way of explanation may be considered) and emphasize the charge comparison method would also use a dual slope characteristic. Requested due date: December 31, 2023.

Outstanding Action Items:

1. **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.
2. **Ritwik Chowdhury** will work on a new subclause to be added to Clause 7 Application Considerations for LCD applications with IBRs. Requested due date: January 31, 2023.
3. **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 completed, and the meeting was adjourned.

We request a meeting at the May 2023 meeting with a room for 50 and a projector. Please avoid conflicts with C48, K22, K31, D42, 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 2023

Draft: Jan 11, 2023

Date: Wednesday, January 11, 2023

Time: 10:40 – 11:50 AM (EST)

Venue: Jacksonville PSRC (In Person/Web Meeting)

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

1. Fifth meeting of D48 working group in a single session with 40 attendees. 12 out of 21 members in attendance. However, quorum was not achieved when counted. Discussion notes and Minutes of meeting dated Sep 14, 2022 are being sent via email for approval.
2. Minutes from May meeting were presented. Discussion about coordination with D42 Line guide. D42 is due by 2024 but may finish early (by 2023). However, D48 may be delayed beyond 2023 at this point.
3. Kamal presented progress of the report draft dated Jan 11, 2023.
4. Daniel Marquis presented on events near IBR lines. Three events from the field were discussed for various operating scenarios. Good interest and discussion. Plan is to add a small section with field events, on discussion with SPT near IBRs. Lots of interest in this topic and will require further discussion.
5. Cross country Fault section was presented by Ilia. Further discussion will be needed.
6. Additional meeting may be arranged in 2023 meetings, based upon the progress of WG.
7. Draft progress and comments could not be reviewed during the meeting. Additional meetings will be held.
8. Comment from Venkatesh Chakrapani to everyone: 11:25 AM ---Is it possible to know which Grid Code is followed for wind farms, as the dead time for lines near to wind farm seems to be much higher than the typical LVRT time (SLG fault) seen in grid codes across the globe. Do we have any signatures from the wind farm? Further discussion with Daniel will be done during next meetings.
9. Following people agreed to review the draft. Section 9 and Cross Country. Section 8.5. If anybody wants to contribute any of the remaining section, please reach out to Ilia and me.

Abu, Venkatesh, Normann, Daqing, Mike Kockott – Full Report

Sajal, Deepak Maragal, Athula, Jason Byerly, Dinesh, Genariel Hernandez, Steve Klecker, Ritwik– (Section 9 and 8.5)

All comments due by 2/24/2023

10. Adjourn 11.55 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: NA

Established Date: May 2022

Expected Completion Date: December 2023

Draft: NA

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

The WG met in a hybrid format on January 10th, 2023, at 9:20 am ET with 14 members and several guests. A quorum was achieved.

Officers presiding – Manish Patel, Joshua Lamb & Miguel Rios

Officer recording minutes- Miguel Rios

Greg Ryan moved to approve May 2022 WG meeting minutes, and the motion was seconded by Josh Lamb. There was no opposition, and the May 2022 WG meeting minutes were approved.

Josh Lamb explained redlines to the draft summary paper that were made to address comments received with WG vote. It was noted that most all redlines are editorial in nature and improves readability of the paper. After brief discussion, WG members in presence voted to move the summary paper for review/approval by the D-Subcommittee.

Alla Deronja and Adi Mulawarman noted that deadline to submit abstracts for 2024 Western Protective Relay Conference and Minnesota Power System Conference is approaching quickly. While the D-Subcommittee is reviewing/approving the summary paper, Manish Patel will go ahead and submit abstract to these conferences.

For next meeting, WG requests a room for 30 with a projector.

Avoid conflict with B10, C45, CTF51.

D51: Single Phase Tripping and Reclosing of Distribution Lines

Chair: Brian Boysen

Vice Chair: Jack Jester

Secretary: Sudarshan Byreddy

Output: Technical Report

Established Date: September 2022

Expected Completion Date: TBD

Draft: NA

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

Presiding Officer: Brian Boysen

Minutes Recorded by: Sudarshan Byreddy

Agenda:

1. Introductions
2. Review September Task Force Meeting Minutes and new WG Membership

3. Review Preliminary Outline and discuss any additions
4. Discuss Editing WG Name and Assignment to remove "Protection" since other considerations will be addressed
4. Solicit Volunteers
 - Draft Paper Sections (minimum 2 per section with one lead)
 - 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. Presentation: Brian Boysen: Evolving Faults: Time permitting

Minutes:

- The D51 Working Group met at 1700 on 1/10/23, this was the first meeting of the working group.
- There were 30 people in attendance (18 in person and 12 hybrid).
- Meeting minutes from the September Task Force meeting was reviewed
- Preliminary Outline was reviewed. Items of note that were discussed included:
 - o Benefits of Single Phase Tripping (Section 1): Improve Reliability
 - o Protection Considerations and Challenges (Section 3): Ground Fault Protection and coordination for evolving faults and reclosing
 - o Distribution System Impact: FLISR, DA, Down Conductors / High Impedance Faults
- Additional Items to potentially be added to the preliminary Outline include:
 - o Ferro-resonance and Grounding
 - o Operational visibility for single phase tripping
 - o Arc Flash / Hot Line work and associated operating modes
- Other Items Discussed:
 - o Higher Voltage Networked Distribution Lines: Would not include since most network systems involve 3ph loads so would not use single pole tripping and could also reference transmission single phase paper for discussions on applying single phase tripping on network protective systems. Will limit scope to radial distribution lines which will be discussed in the introduction section.
 - o Should review of C37.230 and draft to identify and address items in the single phase tripping sections - Brian Boysen to review and present at next WG Meetings
- Assignments / Volunteers for various sections (please have initial drafts completed by May 1, 2023):
 - o Introduction – Brian Boysen
 - o Benefits and Reliability – Swagata Das and Kamal Garg
 - o Ground Fault Protection – Greg Ryan and Brian Boysen
 - o Coordination with upstream and downstream 3ph devices - Sudarshan Byreddy and Jack Jester
 - o Three Phase Customer Loads – Don Lukach and Bruch Makie
 - o Delta Connected Transformers and Capacitors – Adi Mulwarman and Daqing Hou
 - o DER – Open
 - o Fallen Conductors – Kamal Garg and Brian Boysen
 - o Potential New Sections: Ferroresonance, Operational Considerations, Hot Line Work / Arc Flash - Open
- Brian Boysen made a presentation on potential impacts on coordination due to evolving distribution faults

Meeting Requirements for January

Room for 30 with Projector; single session

Liaison Reports

T&D Committee / Distribution Subcommittee

Latest meeting minutes, agendas, and reports are located here <https://cmte.ieee.org/pes-dist/meetings/>

Looking for a volunteer to be our liaison with T&D (presently, 3 working groups that work on the topics relevant to the Subcommittee D).

Old Business

None

New Business

The chair announced a request from Normann Fischer to explore the subcommittee interest on creating a Task Force on investigating forming a Work Group on “Line Protection based on Transient Quantities”. A discussion ensued concerning whether this topic was about applying time-domain quantities for line protection like the travelling wave method. No one made a motion. Since Normann was not present, a decision was made to table this topic until the May 2023 meeting.

General Discussion

Three WGs (D30, D35, and D50) have requested Subcommittee D balloting for their WG outputs (a tutorial, a technical report, and a summary paper). A decision was made to send them at the same time if ready and have a due date for SC member responses in mid-March or early April.

Line protection operations of interest

None

Adjournment

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

SC H met on January 11, 2022, via WebEx and in person with 33 members and 13 guests present comprising a quorum.

Motion to approve September minutes by Mark Admiak, Seconded by Amir Makki, vote was taken via electronically via QR code during meeting to approve the September minutes. September minutes were approved.

Announcements:

- a. The following new H SC members were announced. Ellery Blood.
- b. New items from September 2022 AdCom Meeting
 - i. PSRC P&P and O&P manuals have been updated and are PES-PSRC website.
 - ii. The following IEEE SA online training is required for officers of WGs drafting or revising IEEE standard:
 - 1. Conflict of Interest: Handling Competing Loyalties, required for officers working on IEEE standards.
 - 2. Content Title: Integrity in Action: Compliance for IEEE Volunteers
Deadline to complete has been extended to March 31st. Instructions are being prepared to help those get through the setup.
 - iii. Transactions papers based on completed work have a higher threshold of approval.
 - iv. PSRC is to roll out new membership platform, member planet. Individuals are required to create their own profile. All members and guests have to create their own profiles. Invitations likely to go out this spring. Expect multiple invitations if you are involved in multiple groups.
 - v. PSRC May Meeting will be face to face. Exceptions and limited support will be made for a small percentage of WGs that normally hold virtual meetings between PSRC.
- c. New items from Awards and Recognition Meeting:
 - i. Next awards ceremony will be Monday May 8, 2023, in Vegas!!! Please save the date and try to join us to honor your fellow PSRC members for their work and contributions.
- d. Standards Coordination Meeting did not meet.
- e. New items from SC and reminders carried from prior meetings:
 - i. WG officers to attend Stds Coordination meeting
 - ii. SC Members are required to Vote on Reports

- iii. WG officers are required to submit meeting minutes within two weeks of PSRC meetings.
- iv. iMeet space available for Non-PAR WGs. PSRC Officers have organized documents depository for non-PAR WGs
- v. WG presentations to be reviewed by SC Officers
- vi. Upon work completion, prepare a presentation to the MC
- vii. New mandatory training for Subcommittee Officers and Working Group Officers leading standards work specified by SA. Training includes 15 modules total 8-12 hours. SA will be responsible for tracking the training.
- viii. WG Chairs that they are required to show the Copyright, Patent, and the Participant Slides required from SA

WG business:

P21 - The PSRC I Subcommittee has approved joint sponsorship of the PSCCC P21 task force. PSRC P21/I49 Task Force will meet in May 2023.

H27 PC37.251, Standard for Common Protection and Control Settings or Configuration Data Format (COMSET) Sponsor Ballot Motion

Motion: Working Group H27 motions to submit Standard PC37.251, Standard for Common Protection and Control Settings or Configuration Data Format (COMSET), to IEEE-SA for Sponsor ballot. Motion by Amir Makki, Seconded by Deepak Maragal. Motion passed via QR vote.

HTF55: Motion to extend HT55 Distributed Cyber Physical Assessment for Grid Resilience. Motion by Scott Mix. Seconded by Mario Capuozzo. Motion passed via QR vote.

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 TR84 Application Testing Of IEC-61850 Based Protection and Control Systems.

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. Final report was submitted to the HSC chair. HSC to submit report to HSC members who had provided comments in previous HSC review of TR.

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.

January 2023, Meeting Minutes:

The group met on time with 14 members and guests in attendance. Quorum was established. Patent and Copyright slides were presented. The minutes from the last meeting were approved.

The Chair briefed the group on the status of the latest draft (8.2):

- 1) The comment resolution group completed their work. The resulting draft was submitted to IEEE-SA.
- 2) IEEE-SA completed their review of the submitted draft. The resulting comments were presented.
- 3) The PAR extension request was approved till the end of 2023.

The Group then focused on addressing the comments from IEEE-SA. The group will continue their work electronically and plan to resubmit to IEEE-SA and start the second round of

balloting before the next meeting. The Group plans to meet again at the next meeting in May. A room for up to 20 folks and projector is requested.

Attending Members:

Amir Makki (Softstuf)
Anthony Johnson (SCE)
Cesar Calix (Burns & MacDonnell)
Charles Sufana (Retired)
Eric Thibodeau (Hydro Quebec)
Hugo Monterrubio (Hubbell)
Shane Haveron (AMETEK)

H27: PC37.251 Standard for Common Protection and Control Settings or Configuration Data Format (COMSET)

Chair: Mario Capuozzo
Vice Chair: Benton Vandiver
Secretary: Daniel Sabin
Output: Standard
Established: 2013
Estimated Completion Date: December 2023
Draft: 4.0

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

MEETING MINUTES – 2023 JANUARY 10**MEETING LOCATION AND TIME**

Date and Time: Tuesday, 2023 January 10 (5:00 to 6:10 PM Eastern Time)

Meeting Location: Remote Attendees via WebEx

Chair: Mario Capuozzo
Vice Chair: Benton Vandiver
Secretary: Daniel Sabin

The meeting was chaired by Mario Capuozzo. Minutes were recorded by Dan Sabin.

IEEE PC37.251 PROJECT SCOPE AND PURPOSE

Scope: This standard defines a common format for protection and control configuration or settings data files based on the IEC 61850 System Configuration Language (SCL) format. The format will specify organizational structure and methods of content extension

Purpose: The purpose of this standard is to provide a common format that allows settings data for protection and control functions to be exchanged within systems of components from different manufacturers and third party tools. An instantiated COMSET file will contain standardized IEC 61850 logical nodes and allow vendors to add any extensions that are required.

IEEE PC37.251 PAR

The initial project authorization request (PAR) for PC37.251 was approved by the IEEE SA Standards Board on 2016 February 05, with an expiration date of 2020 December 31.

An extension for this project was approved by the IEEE SA Standards Board on 2020 December 2 with an expiration date of 2022 December 31.

A second extension for this project was approved by the IEEE SA Standards Board on 2022 November 10 with an expiration date of 2023 December 31.

MEETING ATTENDEES

The following 13 people attended the meeting.

| First Name | Last Name | Affiliation |
|------------|-----------|---------------------------|
| Mario | Capuozzo | Doble Engineering Company |
| Shane | Haveron | AMETEK Power Instruments |
| Theo | Laughner | Lifescape Analytics |
| Thomas | Rudolph | Schneider Electric |
| Daniel | Sabin | Schneider Electric |
| Benton | Vandiver | Hitachi Energy |
| Jun | Verzosa | Doble Engineering Company |
| Christoph | Brunner | It4power |
| Alex | Apostolov | Omicron |
| Amir | Makki | Softstuf |
| Marcos | Velazquez | Doble Engineering Company |
| Gayle | Nelms | SEL |
| Xiangyu | Ding | S&C Electric Company |

MEETING DISCUSSION

Quorum was achieved as a majority of the working group members were present.

The chair showed the required IEEE SA slides regarding essential patents and copyright policy. The chair made a call for essential patents and there were none reported.

The minutes from the previous meeting in December 2022 were approved.

The working group discussed whether there were technical changes needed in Clause 6 before IEEE SA Ballot. The working group consensus was that no changes needed to be completed before the initial Standards Association Ballot.

Action Item: The WG chair will contact the H Subcommittee chair to ask the subcommittee to approve a motion to initiate the Ballot Invitation process (and perhaps review the standard).

NEXT MEETING

The next meeting of the IEEE PES Power System Relaying & Control Committee will be during the week of May 8, 2023 in Las Vegas, NV. For more information, see <https://pestechical.org/>.

H30: IEC 61850 User Feedback

Chair: D. Maragal

Vice Chair: A. Martin

Secretary: D. Tessier

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.

Agenda

- Technical topic: Review of XCBR, CSWI, XSWI, SCBR Logical Nodes
- Review of intended usage & parameters
- Discussion on application, and Feedback to WG10/Manufacturers
- Update on H30's pending & past:
- IEC 61850 UFTF & TISSUE database
- Past Agenda & Topics Overview
- Open Discussion on User's Opinions & Feedback
- Future Meeting topics & proposals

20 attendees attended the meeting.

Deepak briefly described purpose of H30 forum and the progress we have made so far.

Upon request from Dustin and other users, an open call was asking if any had encountered issues with interoperability of 9-2LE and/9-2LE Ed2.1 systems. Ande (Schneider Electric)

mentioned that they do test the conditions in their lab for their products and it would be worthwhile to know more. Few attendees expressed interest to know more.

The chair brought out the user experience & difficulties in utilizing the XCBR and CSWI logical nodes. The XCBR being the switchgear logical node does not have inputs for wiring Trip Coil and Close Coil.

The group reviewed the existing IEC 61850 model and discussed that the hardwire inputs and outputs has to be dealt separately. The group discussed extensively the need and implementation from manufacturers. Thomas Rudolph mentioned that this gap to represent hardwired inputs and outputs has been identified in TC57 and shared the work-in-progress from IEC TC57 working group. The current draft model does include the trip coil and close coil representation. However, it still lacks detailed representation for various types of circuit breaker models such as dual trip coils. In relation to this, the group discussed the next action item for H30 is as follows:

- Future meeting on the modelling of physical resources such as circuit breaker. H30 to coordinate with others WGs towards developing model requirements for various types of switchgears & circuit breakers.
- Request for WG10 to prioritization of TC17 collaboration

Deepak also discussed the issue of representing multiple breaker position contacts. The group discussed that issue can be addressed through different logical devices.

The group concluded to discuss in next H30 meetings these additional items

- Future meeting on the application modelling (7-5/500)
- Future meeting on the 9-2LE/9-2 Ed2.1 mixed systems

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 12 members and 1 guest

Chair discussed the concern representing lockouts and requested every manufacturer to take look into their model & private namespace for representing:

- a) BreakerFailure lockout
- b) Reclose Block lockout
- c) Transformer/Bus Diff lockout

The team discussed the IEC 61850 PIOC model from various manufacturers:

- 1) SEL (Arun & Priyanka) mentioned that they do not implement any private namespace Data Object (DO) for PIOC
- 2) Schneider Electric (Andre) had provided PIOC models last minute for certain model of relays. He will refine and provide updated PIOC private namespace (DO) inclusive of other SE relay models
- 3) Basler Electric (Todd Martin) PIOC model was discussed and following observations were made:
 - a. The analog input to the PIOC should be referenced through Inref
 - b. The analog measurements could include phase quantities or sequence quantities. In case where sequence quantities are required, MSEQ should be utilized for Inref. The PIOC element should not contain private namespace for sequence quantities.

H40: Databases used in SAS

Chair: T. Laughner

Vice Chair: M. Capuzzo

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

Attendees:

Members: Theo Laughner, Craig Preuss, Anthony Johnson, Galina Antonova

Guests: Lakshan Piyasinghe, Aaron Martin, Jack Wilson, Dan Sabin

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

WG H41 did not hold an official meeting. HSC Chair, Aaron Martin facilitated a discussion honoring D. Holstein, while inquiring the status of the group. Craig Preuss discussed P21 and

potential involvement of P1646. Malia Zaman, pointed out that PAR is set to expire in 2023. David Dolezilek and Craig Preuss agreed that there wasn't sufficient time to complete the work. Malia Zaman recommended letting the PAR expire and then requesting a new PAR in 2024.

H44: Monitoring and Diagnostics of IEC 61850 GOOSE and Sampled Values Based Systems (PC2030.100.1)

Chair: Aaron Martin
Co-Vice Chair: David Dolezilek
Output: Guide
Established Date: 2018
Expected Completion Date: 2022
Current Revision: 3.0

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.

H44 met with 11 members, 6 attendees in person, and 25 attendees online.

Introduction

Quorum was met.

Copyright Slides, Participant Slides and Patent Slides were presented to the group

Meeting minutes from May 31st and September 9th meeting were approved

Aaron Martin reported that the all of the assignments have been received and the document has been formatted.

Draft 4 has been loaded to imeet page.

Aaron Proposed circulating the draft within WG for comments acknowledging that there is some redundant material and that. WG Members concurred.

Working group members will be invited to begin reviewing draft and provide comments.

Next meeting will be in May allowing time for comments on draft.

Chair called for a motion to adjourn. Scott Mix motion, Dave Dolezilek.

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

| Members | | |
|----------------|-------------|---|
| NAME | AFFILIATION | |
| Alex Apostolov | Omicron | X |

| | | |
|-------------------------------|--------------------|---|
| Nestor Cassillo | Doble | |
| Eugenio Carvalheira | Omicron | X |
| David Dolezilek | SEL Inc. | |
| Aaron Martin | BPA | |
| Herbert Falk | Outside the Box | |
| Scott Mix | PNNL | X |
| Ryan Newell | TRC Companies | |
| Dean Ouellette | RTDS | X |
| Jose Ruiz | Doble | |
| Craig Preuss | Black and Veach | |
| Arun Shrestha | SEL Inc. | |
| Dustin Tessier | Tesco | X |
| Benton Vandiver | Hitachi | |
| Jun Verzosa | Doble | |
| Emmoji Vundekari | GE | |
| Karen Legget-Wyszczelski | SEL Inc. | |
| Guests and Past Guests | | |
| Abel Gonzalez | | |
| Amin Banaie | GE | |
| Alexander Praticzka | Hitachi Energy | X |
| Andre Melo | SE | X |
| Andre Uribe | Powergrid | |
| Angelo Tempone | Duke Energy | |
| ArundoDai Chanda | Burns McDonnell | |
| Byungtae Jang | Naver | |
| Bharat Nalla | SEL Inc | |
| Christoph Bruner | It4power | |
| Dan Ransom | GE | X |
| Daniel Nordell | Xcel Energy | |
| Dinesh Gurusinghe | RTDS | X |
| Emmoji Vunderkari | GE | |
| Farzad Khalilpour | GE | |
| Fernando Calero | SEL Inc | |
| Gayle Nelms | SEL Inc. | X |
| Greg Zweigle | SEL Inc. | |
| Hani Al-Yousef | Eaton | |
| Hugo Monterrubio | Hubbell / Beckwith | X |
| Jack Wilson | Ameren | |
| Jay Shumar | Hitachi Energy | X |
| Jesse Sliva | SCE | |
| Jeff Dagle | PNNL | |
| Jeff Pack | Power Engineers | |
| Jim Hackett | | |
| Joe Xavier | ABB | X |
| Jorg Blumshein | Siemens | |

| | | |
|--------------------|---------------------|---|
| Marcos Velazquez | Doble | |
| Mario Capuozzo | Doble | X |
| Matt Black | Sargent Lundy | X |
| Michael Cummingham | Powergrid | |
| Mital Kanibar | GE | |
| Mohit Sharma | Megger | |
| Nuwan Perera | Earlphase | |
| Priyanka Nadkar | SEL Inc | |
| Rich Hunt | Quanta Technology | |
| Romulo Bainy | University of Idaho | |
| Safety Pepljak | YRC Companies | |
| Shane Haveron | Ametek | |
| Thai Li | Hubbell | |
| Thomas Rudolph | SE | X |
| Wayne Pawley | Sisco | |
| Xiangyu Ding | S&C E | |
| Yanfeng Gong | SEL Inc. | |
| Yuchen Lu | ERPI | |
| Yujie Yin | GE | |
| Wang Zitao | | |

H45: C37.300 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: 12/2022

Draft: 5.0

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

(Hybrid) Meeting # 37 (January 11, 2023) Minutes

The working group met on January 11, 2023 with 57 attendees - 21 of them are voting members (out of 29), one is a non-voting member (out of 8) and 35 guests. The names and affiliations of attendees are enclosed in Annex I, along with their mode of participation.

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

Quorum was achieved and maintained throughout the meeting. Proposed agenda as in Annex II was approved (Motion – Joe, Second – Alex, Dissented - None).

Chair informed that minutes of the last WG meeting held on Dec 09, circulated via email dated Dec 13, 2022, were approved without any modifications. Chair also provided status of approval on proposed comment resolutions for Clause 3.0. Majority of the members approved the proposed resolutions, circulated via email dated Dec 13, 2022, without any comments. One of the members provided alternate suggestions for comment ID 5-3-2 only. Continuing with the practice of building consensus, discussions were held on alternate resolution proposal for comment ID 5-3-2, the last comment to be resolved for Draft 5.0. After about 30 minutes of discussions, resolution could not be achieved with two options emerging. Chair proposed to resolve the comment ID 5-3-2 via email which was agreed.

Chair then discussed the plan for Draft 6.0 preparation by mid-February 2023 for WG balloting - incorporating comment resolutions incrementally starting with Clause 4.0, followed by Clauses 5.0, 6.0, and 1, 2 & 3. Annex B-J and Annex A will be updated as and when related main clauses are updated. Chair requested volunteers for expedited review of each clauses as and when they are updated and posted in iMeetCentral to ensure that all comments are incorporated as per agreed resolutions. Following volunteers (except one which was assigned by the chair) agreed to review respective clauses expeditiously, without providing any new comments:

Clause 4.0 – Joe and Hugo

Clause 5.0 – Austin and Alex

Clause 6.0 – Rich and Erin

Clauses 1.0, 2.0 and 3.0 – Ritwik (assigned by chair) and Jay

Annex B-J – Arun and Yuan

WG members will have four (4) weeks to review and ballot Draft 6.0 after complete Draft 6.0 is posted in iMeetCentral with an invitation to ballot.

Chair then presented the directory structure of Draft 6.0 related documents in iMeetCentral for easy navigation by members.

The updated project plan (R3) posted in imeetCentral was then discussed. Members felt that the updated project plan is achievable with some effort and WG members will have a challenging 2023 like that in 2022 to meet the targeted milestones.

Chair explained to the members the plan to initiate IEEE balloting process for a 6-week balloting period instead of traditional 4-week, after successful WG balloting, to ensure a large pool of participants which may be helpful for a wider acceptance of a new guide such PC37.300. Discussions were held on this extended window with some clarifying questions and members agreed to the proposal.

Chair requested attending guests to express their interest for PC37.300 activities at the IEEE myProject website, to receive WG meeting invitation and also to receive invitation from IEEE SA to participate in the PC37.300 balloting process when initiated.

WG will meet during the PSRC meeting in May 2023. Any virtual meeting, prior to the May meeting, will be announced to the WG members and interested parties.

Meeting was then adjourned (Motion – Rich, Second – Jay).

Sincerely,

Ratan Das Paul Myrda Mital Kanabar

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

| Guests | | | |
|--------|----------------|-------------|--------------------|
| # | First Name | Last Name | Affiliation |
| 1 | Carolina | Arbona | Burns& McDonnell |
| 2 | Abu | Bapary | AEP |
| 3 | Paul | Chin | Qualus Corp |
| 4 | Catherine | Dalton | EPRI |
| 5 | Alla | Deronja | ATC |
| 6 | David | Dolezilek | SEL |
| 7 | Kevin | Donahoe | GE Grid Solutions |
| 8 | Daniel | Freeman | Schneider Electric |
| 9 | Genariel | Hernandez | Qualus Corp |
| 10 | Chris | Huntley | SEL |
| 11 | Colin | Gordon | SEL |
| 12 | Byungtae | Jang | KEPCO |
| 13 | Sugosh | Kuber | Megger |
| 14 | Deepak | Maragal | Power Eureka |
| 15 | Aaron | Martin | BPA |
| 16 | Andre | Melo | Schneider Electric |
| 17 | Scott | Mix | PNL |
| 18 | Melvin | Moncey J | BV |
| 19 | Prianka | Nadkar | SEL |
| 20 | Gale | Nelms | SEL |
| 21 | Paras | Patel | TRC |
| 22 | Priya | Raghuraman | Siemens |
| 23 | Miguel | Rios | Southern Company |
| 24 | Neil | Saia | Entergy |
| 25 | Lynn | Schroeder | |
| 26 | Mohit | Sharma | SEL |
| 27 | Veselin | Skendzic | SEL |
| 28 | Jeremiah | Stevens | Quanta Technology |
| 29 | Justin | Turner | GE Grid Solutions |
| 30 | Eric | Udren | Quanta Technology |
| 31 | Jim | Van De Ligt | Shaw |
| 32 | Jun | Verzosa | Doble |
| 33 | Joshua | Watson | NPPD |
| 34 | Thomas | Wisniewski | We Energies |
| 35 | Yujie | Yin | Quanta Technology |
| | In-Person only | 15 | |
| | Virtual only | 15 | |
| | Hybrid | 5 | |
| | Total | 35 | |

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 2023**Draft:** v0.55

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

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.

Meeting 10 January 2023, 17:00 – 18:10 EST at the Jacksonville Hyatt Regency Riverfront, City Terrace 12, called to order 17:00pm. One of the working group officers were present. The secretary presided over the meeting and Dean Ouellette recorded minutes.

The meeting was called to order with 25 in attendance of which 5 were voting members, 0 non-voting member, and 20 guests. Quorum was not achieved.

A motion was made by Dinesh Gurusinghe to approve the agenda; seconded by Rich Hunt. The agenda was approved.

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 new IEEE Participant Behavior slides were also shown.

Presentations:

Jorg Blumenschien presented IEC TC95 WG2 status update. The original output of the WG was to be a TR but has been made into a TS. The current work will become a technical specification IEC TS 60255-216-1 and it has been requested that members of H47 review the current form and provide comments ASAP. Eric Udren from the US National Committee will co-ordinate access to the draft document.

Old Business

The Scope and Assignment were reviewed. Names were not given; volunteers know who you are!

New Business

Request for presentation from other members and guests on relevant topics was discussed. ABB and Schneider Electric will provide some potential topics to be presented in future meetings.

Avoid Conflicts: P1, S15, C33, H50, H46

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.

Outline: write all from protection perspective (not IT com prospective)

1. Introduction (seek a volunteer)

Why consider packet-switched networks rather than TDM/SONET

Importance of utility grade equipment, not telecom or off the shelf

Advantages and disadvantages of using packet-switched technologies.

How packet-based networks are structured

Show typical application, with connections, etc

CIP questions are around this as well

Performance parameters (Steve and Galina to check H32 report for references)

i. Latency

- ii. Asymmetry
- iii. Failover
- iv. Availability

2. Utility use cases (Suggested to use a modified IEC template)

- i. SDG&E (presented)
- ii. Altalink
- iii. Idaho Power
- iv. MidAmerican
- v. BPA (to be presented)
- vi. TVA (presented)

3. Lessons learned (Key content- in depth learnings)

- a. Important considerations
 - i. Network Engineering
 - ii. Time synchronization

4. Conclusions

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: 1.6

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 10 January 2023, 10:40 – 11:50 CST at the Jacksonville Hyatt Regency Riverfront, River Terrace 3, called to order 10:43am. All working group officers were present. The chair presided over the meeting and Jay Anderson recorded minutes.

The meeting was called to order with 29 in attendance of which 8 were voting members, 1 non-voting member, and 20 guests. Quorum was achieved.

A motion was made by Chris Huntley to approve the agenda; seconded by Rich Hunt. The agenda was approved.

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 new IEEE Participant Behavior slides were also shown.

A motion was made by Chris Huntley to approve the SEPTEMBER 13, 2022 meeting minutes; seconded by Rich Hunt. The Minutes were approved.

Presentations:

Jay Anderson presented the use cases created by the Energy Sector Use Case task force for the P1952 Standard for Resilient Positioning, Navigation, and Timing (PNT) User Equipment. The P1952 WG is working on technical requirements and expected behaviors PNT User Equipment (UE). The scope is limited to the reception, ingestion, processing, handling, and output of PNT data, information, and signals.

Members of the subgroup are Dean Ouellette, Ken Fodero, Steve Klecker, Marcel Geor, David Howard, Jeffrey Dagle, and Jay Anderson. Presentations have been (or will be) made to the P1952 WG on:

- Line current differential protection
- Traveling wave fault location
- Synchrophasors (IEC/IEEE 60255-118-1)
- Sampled values (IEC 61850-9-2)
- Synchronized Sequence-of-Event (SOE) logging

Jeff Dagle provided additional background.

Discussion around GNSS sources and the use of better oscillators (cesium/rubidium/etc.)

The use cases will be posted to the H50 iMeet site.

Old Business

The Scope and Assignment were reviewed. Names were not given; volunteers know who you are!

Reminder of the vice-chair's email change.

New Business

Review draft 1.7

Rich Hunt to review content in 3.7 and 3.8

Jay has reached out to Deepak Maragal for clarification on options for redundancy in antenna systems.

Jay will post the P1952 energy sector use cases to the H50 iMeet site

Nicholas K will review the P1952 use cases and copy relevant info to the H50 report

The document should be aligned with IEEE 2030.101-2018 "IEEE Guide for Designing a Time Synchronization System for Power Substations"

Note: we were not complete by 12/31/22. Per the H chair, not an issue.

Nicholas Kraemer made motion to adjourn; Rich Hunt second.

Meeting was adjourned at 11:41 EST.

Note: files for the H50 workgroup are stored in iMeet Central at:

<https://ieee-sa.imeetcentral.com/psrcc-h50/folder/WzlwLDEyNTQ5NTk4XQ>

Avoid Conflicts: P1, S15, C33, H46, H47

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)

Meeting Proceedings:

WH H51 did not meet in September 2022

WG H52 – Common Format for Naming Time Sequence Data Files (C37.232, COMNAME)

Chair: Amir Makki

Vice Chair:

Output: Revision of an Existing Standard

Established: 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.

H53 Working Group –Use Guide for Smart Distribution Applications P1854

Chair: Xiangyu Ding

Vice Chair: J. Lombardo

Output: Guide

Established Date: 09/2021

Completion Date: 12/2023

Current Revision: 20230111

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

The WG met on Wednesday, January 2023, with 4 members and 7 guests in attendance. A quorum was not presented. Attendees introduced themselves and their affiliations.

The call for patents was presented – no response.

The call for copyright slides was presented – no response.

- The draft P1854 document was reviewed and edited starting in section 4.2.2.1 on microprocessor-based Underground Network Protector Relay
 - The first paragraph was revised to better differentiate the differences between traditional underground network protector relays and microprocessor-based underground network protector relays with communication capabilities
 - The second paragraph was converted into a bulleted list focused on the monitoring capability of microprocessor-based underground network protector relays

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 |
| Jay Herman | EPRI |
| Guests | |
| Bryan Hosseini | Duke Energy |
| Dan Nordell | |
| Peiman Dadkhah | NuGrid Power Corp |
| Joe Xavier | ABB |

| | |
|------------------|----------------|
| James Bougie | Albireo Energy |
| Yanfeng Gong | SEL |
| Priya Raghuraman | Siemens |
| Byungtae Jang | |

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

Chair: Mark Adamiak
Vice Chair: Zach Makki
Secretary: Dan Sabin
Output: Standard Revision

HTF55: Distributed Cyber Physical Assessment for Grid Resilience

Chair: Jeff Pack
Vice Chair: Craig Rieger
Secretary:
Output: Report
Established Date: 05/2022
Expected Completion Date: 2024
Current Revision: 1.0

Assignment: Investigate Distributed Cyber Physical Assessment for Grid Resilience and evaluate participation with other technical committees, societies, groups, and associations that may have interest.

- a) Jeff Pack, Chair, presided and took the minutes
- b) Meeting participants

| Name | Affiliation | Attendance Type (W – Web, P – Phone, L – Local) | Member - Guest |
|---------------------------|---------------------------|---|----------------|
| Jeff Pack (Chair) | POWER Engineers | W | M |
| Craig Rieger (Vice Chair) | Idaho National Laboratory | W | M |
| Jay Herman | EPRI | W | G |
| Byungtae Jang | KEPCO | W | G |
| Brian Johnson | University of Idaho | W | M |

| | | | |
|----------------|---------------------------------|---|---|
| Van Le | Western Area Power Authority | W | G |
| Chase Lockhart | Burns and McDonnell | W | G |
| Aaron Martin | Bonneville Power Administration | W | G |
| Scott Mix | PNNL | L | G |
| Dan Nordell | Xcel Energy | W | G |
| Craig Preuss | Black and Veatch | L | M |

- c) Quorum was achieved.
- d) The agenda was reviewed with no recommended changes.
- e) The previous meeting minutes were approved.
- f) This is the third meeting of the Task Force. Martin indicated that we would need to extend the Task Force for 2023 so we can complete the assignment. Pack will draft a short statement for Martin to indicate current status and justification to extend the Task Force.
- g) Assignment Discussion:
 - a. We discussed methods to gather information on potential collaborators and current work in the area.
- h) Survey Review Discussion
 - a. Preuss comment – add an “other” category regarding company type for Question 1. Agreement that this is a good idea and will be added to the survey.
 - b. Preuss comment – seems confusing to include cybersecurity and network products in Question 3a. Also seems strange to have IEC-61850 in the list – no other specific protocols such as DNP are listed. After discussion, consensus was reached on removing IEC-61850 and splitting the question into two questions to eliminate confusion on cybersecurity and network topics.
 - c. Martin commented that Question 3a response from power asset owners would probably be vague and not provide value to the Task Force. The terms used in the question also require some definition so everyone is interpreting them in a similar manner. Discussion on rewording or removing the question resulted in leaving the question in for now while adding some context based on the respondent’s role. Terms used in the questions will be reviewed and defined.
 - d. Preuss comment on Question 3b including synchrophasor – a source of data – in with analytic tools such as transient analyzers. Will replace synchrophasor with dynamic state estimator or others.
 - e. Preuss comment on Question 3c – no examples may indicate that there are no tools available. Change to add examples or expand from Question 3b and state “Other cybersecurity or power system decision...”.
 - f. Le comment on Question 3c that this information from his company would not be pertinent to the effort. As part of the survey, we will add an instruction that not every question is required to be answered by every respondent.
 - g. Preuss comment on Question 4d that integration should be part of Question 3c also. Will develop and add integration to Question 3.
 - h. Preuss comment on Question 5 – there is no Question 5d similar to Question 4d.

There were several comments from Mix, Rieger and Preuss on differences in this area between vendors and integrators. The two categories are blending together and may be better represented in the survey as Third Party Suppliers and combining Questions 4 and 5.

- i. Preuss comment on Question 6 regarding term “Research to Practice” requires definition so all potential respondents know what the terms are. Terms used in the questions will be reviewed and defined.
- i) The chair displayed the current process for developing and distributing a survey under the PSRC Organization and Procedure Manual. There are several steps to completing the survey that the Task Force will continue working toward.
- j) The meeting was adjourned at 6:08 P.M.
- k) Next scheduled meeting is May 2023 in Las Vegas, NV – the chair will send out draft meeting minutes and considerations for working sessions held via web conference prior to the scheduled meeting.

OLD BUSINESS

NEW BUSINESS

PSCCC P21 proposal to form to form joint task force to create a PES technical report based upon the output of the PSCCC P21 SG

HSC discussed the motion and decided not to join P21 at this time.

Motion to adjourn Amir Makki Seconded Alex Apostolov

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

**HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL
Wednesday January 11, 2023, 2:45 PM EST**

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. Thank guests for attending
 - b. Thanks to outgoing I-SC C Jim Niemira for his service!
 - c. Welcome incoming I-SC VC Angelo Tempone!
 - d. Congratulate Chase Lockhart, Todd Martin, and Scott Cooper for MC membership!
3. Many thanks to former members of the I-SC:
 - a. Art Buanno
 - b. Jeff Long
 - c. Peter McLaren
 - d. George Moskos
4. Welcome to new members of the I-SC:
 - a. Gary Kobet
 - b. Hugo Monterrubio
 - c. Zitao Wang
5. Determine a Quorum (**39 members** total in I SC)
 - a. Attendance: 30 (min 20 for quorum; YES X or NO)
6. Approval of Minutes of the September 24, 2022, meeting
 - a. Motion entered by: Hugo
 - b. 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)
 - 369 Total Registered with PSRC and PSCCC as primary interest including 26 newcomers
 - c. *Future Meetings – See “Future Meetings” page on PSRC website
all plans subject to change:
Trying to get back to In Person meetings.*
 - May 2023 – Las Vegas, NV
 - September 2023 – Myrtle Beach, SC
 - January 2024 (JTCM) – New Orleans, LA
 - May 2024 – Buffalo, NY

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- d. 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!>**
 - Three officers: Chair, Vice-Chair, and Secretary
 - **All WG Officers must be members of IEEE SA**
 - e. **Working Group sign-in sheets – use confidential procedure!!!**
 - See instructions on PSRC website for how to create your Working Group roster and attendance list for handout at your meeting. Email addresses are no longer permitted to be placed on your sign-in sheet. Attendees must add their email address when they register for PSRC meetings.
 - 123Signup IS NO LONGER AVAILABLE. Use a spreadsheet to maintain attendance records. Use BCC on email correspondence to maintain confidentiality of user contact information. Attendance roster should contain name and affiliation, but not email addresses, phone numbers, or other contact information.
Begin using new Member Planet Association Management System when available. You may receive an email around March or April 2023 asking you to create a profile. Do so before the deadline—otherwise you may not be in your WG mailing lists. This system will also be used for registration, possibly starting September 2023 PSRC meeting.
 - f. For PAR-related work, present the new patent slides and *record in your minutes* whether essential patent claims exist. If there are none, please write this into the minutes. **Do this at every working group meeting.** New JUNE 2021 slides available and are at <http://standards.ieee.org/about/sasb/patcom/materials.html>. To expedite your meeting, send the slides with the meeting agenda so meeting attendees can review ahead of time.
 - g. Looking for Webinars to publicize our PSRC work products as part of Global Outreach
 - Availability of WebEx for presentations by IEEE. Every WG that has completed their work is encouraged to present it to the IEEE community through WebEx which will project our work. Please contact Cathy Dalton, Chair of Publicity group or Michael Thompson, Gene Henneberg, or Jim Niemira.
 - h. Looking for presentations for future Main Committee meetings – please contact Ritwik Chowdhury.
 - i. The PSRC Committee is international and open to anyone who cares to attend.
 - j. New “Awards” page on PSRC website—with pictures of recent awards ceremonies
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

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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
- 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
- **Mandatory Training for all IEEE-SA WG Officers. Due within 60 days of project approval and by March 31, 2023, for existing WGs.**
<https://iin.ieee.org/learnerpage.aspx>
- 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. **Make sure that on the Meeting Room Request (MRR) form for the *May 2023* meeting that you include scheduling conflicts to avoid, e.g. “do not conflict with I50, D87, ...” etc.**
- e. 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.
- f. 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

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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.

- g. 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.
- h. 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!
- i. 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.
- j. **iMeet Central** (formerly Central Desktop) is to be used for IEEE Guide / Recommended Practice / Standard documents with a PAR
- k. 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.
- l. Standards WG Awards - The IEEE Standards Association Working Group Awards has a new Procedure to request certificates of appreciation for completed (Approved Standard) work.
 - WG Chair or WG VC must request certificates directly from the IEEE-SA. Awards can be shipped to our next PSRC meeting hotel for announcement and distribution or can be shipped to the requestor. The request for the SA certificates must be made at:
<http://standards.ieee.org/develop/awards/wgchair/wgawards.html> You will need 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 future 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!
- m. 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.
- n. Links to PES:

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- 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

9. Working Group Reports – 2 minutes each, MAX.

What is your status? Are you on track? Do you need help?

| WG/TF # | Name | Officer |
|---------|---|--|
| I2 | Terminology Review | Mal Swanson |
| I4 | International Standards Development | Eric Udren |
| I26 | Review and Expand Transaction Paper on Mathematical Models of Current, Voltage, and Coupling Capacitive Voltage Transformers | Mike Meisinger |
| I29 | PC37.110 – IEEE Draft Guide for the Application of Current Transformers Used for Protective Relaying Purposes – Revision of C37.110-2007 | Joseph 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 |
| I32 | A Survey of Protective System Test Practices | Andre Uribe Will Knappek |
| I33 | Review of Relay Testing Terms | Scott Cooper |
| I35 | PC37.2 - Standard Electrical Power System Device Function Numbers, Acronyms, and Contact Designations – Revision of C37.2-2008 | Mike Dood |
| 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 |
| 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 |

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| | | |
|-----|--|----------------------------|
| 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 |
| 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 |
| I41 | PC37.90.3 - Standard Electrostatic Discharge Tests for Protective Relays – Revision of IEEE C37.90.3-2001 | Steve Turner |
| I43 | Investigate response to USA executive order regarding EMP protection | Angelo Tempone |
| 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 |
| I45 | Investigation of Grounding and Bonding Issues Associated with Substation Wiring Practices and Instrumentation | Adrian Zvarych |
| I46 | Review and revise: IEEE C57.13.3-2014 – IEEE Guide for Grounding of Instrument Transformer Secondary Circuits and Cases | Bruce Magruder |
| I47 | Review and revise: IEEE C37.231-2006 – IEEE Recommended Practice for Microprocessor-Based Protection Equipment Firmware Control | Don Burkart, Amir Makki |
| I48 | Review and revise: C37.103-2015 – IEEE Guide for Differential and Polarizing Relay Circuit Testing | Mohit Sharma |

I2: Terminology Review

Chair: Mal Swanson

Vice Chair/Secretary: Fred Friend

Output: Terminology recommendations to working groups

Established Date: circa 1995

Expected Completion Date: on-going

Draft: N/A

Assignment: Review drafts of PSRC publications for proper terminology, abbreviations, and symbols; and to recommend additions and changes to the PSRC Terminology database as appropriate

The hybrid meeting was called to order by Mal Swanson, Chair at 10:40 am (Eastern Time) on January 11, 2023, with Fred Friend, Vice-Chair recording minutes with 10 members and 4 guests in attendance. Two new members were welcomed: Kevin Donahoe and Benton Vandiver. Quorum was achieved. The minutes from the September 2022 meeting were reviewed with no corrections provided, Roger Whittaker motioned for approval and was seconded by Mal Swanson with unanimous approval. Roger Whittaker motioned for approval of the agenda, seconded by Mal Swanson with unanimous approval.

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Updates were given on each of the assignments. One new assignment was made: P1854 to Fred Friend. Fred Friend resigned as Vice Chair and Claire Patti has accepted the position. Benton Vandiver will be a terminology liaison to the PSCCC.

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

The meeting was adjourned at 11:45 am (Eastern Time)

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)

WG I4 met on January 10 at 5 PM with 11 attendees - 6 in person and 5 virtual. This comprised 7 members and 4 guests. After introductions, the Chair asked for corrections and comments on prior minutes – none were brought up.

- The chair discussed the corrigendum brought forward by the Chinese national committee with respect to 60255-187-1. The US national committee will support the corrigendum and vote “yes” by January 27 deadline if no members express concerns with circulated document.
- The chair gave an update on the state of the following IEC standards:
 - IEC 60255-1 Edition 4, Common Requirements – FDIS approved and ready to publish (later reported as published and available now).
 - 60255-26 Edition 4, EMC Requirements - FDIS approved and ready to publish (later reported as to be published in weeks).

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- 60255-27 Edition 3, Safety Requirements - FDIS approved and ready to publish (later reported as to be published in weeks).

The chair thanked all those involved in helping craft and review these standards.

- The vice chair gave an update on the status of IEC 60255-187-3, *Functional Standard for Transmission Line Differential Relaying*. The CD document is now available and is being circulated to interested members of the PSRC for review via WG D34, now commissioned for this review and coordination purpose. All interested members should contact the chair of D34, Normann Fischer, if they want to review the standard draft.
- Work on 60255-187-2 *Functional requirements for busbar differential relays* will remain halted until work on -187-3 is complete, due to availability of Maintenance Team members to work on it.
- The Vice Chair also provided updates on the work being done on 60255-132 *Directional power element functional standard* and 60255-167 *Directional overcurrent element functional standard*. Both these documents are in CD status and have also been commented on within the TC 95 MT4 working group.
- The Chair discussed the collaborative work being done between IEC TS 60255-216-1 and the PSRC (H47) with respect to requirements for protective relays receiving data streams from external sources like merging units. Joerg Blumschein is acting as liaison between IEC and PSRC. 216-1 has just been changed from a technical report (TR) to technical standard (TS) status; a list of standard requirements to be included has been circulated in the document 95/529/INF.
- TC 95 is launching a new working group to develop IEC 60255-216-3, a testing standard for “Protection Data Communication for Line Current Differential Protection Systems”. The US and Canadian members of IEC will assist in drafting these standards. Normann Fischer, Ilia Voloh, Veselin Skendzic, and Chris Huntley will form part of the US/Canada group that will craft and review this standard. The US and Canadian National Committee Technical Advisors – Eric Udren and Bogdan Kasztenny respectively – are to align national participant lists for 216-3 development.
- A joint working group has been formed between the IEEE and IEC to work on a dual-logo COMTRADE revision, base. The work will be done within the PSRC in WG H54, with participation from IEC TC 95 representatives. This work will produce the dual logo standard IEC 60255-24/IEEE C37.111 based on input from PSRC WG H35 recommendations for COMTRADE revision.

Attendees:

Eric Udren – Chair

Normann Fischer – Vice Chair

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Members: Chris Huntley, Bill Morse, Jim Niemira, Veselin Skendzic, Ilia Voloh
Guests: Travis Mooney, Oscar Bolado, Hong Wang, Dan Nordell

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 we are balloting the report and have only received three responses – one approval w/o comment and two with comments.

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. PC37.110 is on the RevCom January 30, 2023, agenda and is waiting for approval for publication.

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

Chair: Brian Mugalian

Vice Chair: Jerry Ramie

Secretary: Craig Preuss

Output: Standard

Established Date: 05-Feb-2016 (PAR approval date)

Meeting Date: January 10, 2023

Expected Completion Date: 31-Dec-2023

Draft: 3.1

Assignment: Revise 1613

- a) Officer presiding: Brian Mugalian
- b) Officer recording minutes: Craig Preuss
- c) Call to order, approximately 9:20 am Central time
- d) Chair's remarks, general welcome
- e) Results of call for quorum: 8 members in attendance for quorum
- f) Approval of Agenda: Jerry Ramie motion, Mike Dood, second. No objections. Motion passed.
- g) Approval of Minutes of previous meetings: September 2022 motion Jerry Ramie, second Claire Patty. No objections. Motion passed.
- h) Patent slides were shown, no claims were made.
- i) Copyright slides were shown.
- j) Participant behavior slides shown.
- k) Reviewed comment categorization by Comment Resolution Team. Resolved editorial comments.
- l) PAR extension granted until the end of 2023.
- m) Finished reviewing comments. Draft and comment file to be posted on iMeet for voting members to review
- n) No items reported out of executive session
- o) Recesses and time of final adjournment, approximately 10:30 am Central time.
- p) Next meeting date and location, conference calls as noted above.

Meeting Participants:

| <u>Name</u> | <u>Affiliation</u> | <u>Voting Status</u> (voting member, non-voting member, guest) |
|--------------------|---------------------------|---|
| Brian Mugalian | S&C Electric Company | Chair |
| Craig Preuss | Black & Veatch | Secretary |
| Claire Patty | PGE | Member |
| Eric Udren | Quanta | Guest |
| Thomas Rudolph | Schneider Electric GmbH | Voting Member |
| Chase Lockhart | Burns & McDonnell | Guest |
| Jim Niemira | S&C Electric Company | Guest |
| Chris Huntley | SEL | Guest |

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| <u>Name</u> | <u>Affiliation</u> | <u>Voting Status</u> (voting member, non-voting member, guest) |
|-------------------|-------------------------|---|
| Tony Bell | Ametek | Guest |
| Travis Mooney | SEL | Guest |
| Bill Morse | SEL | Guest |
| Jay Anderson | SEL | Voting Member |
| Michael Meisinger | S&C Electric | Voting Member |
| Jay Herman | EPRI | Guest |
| Abdel Hamid | Hydro Quebec | Guest |
| Galina Antonova | Hitachi Energy | Guest |
| Hani Al-Yousef | Eaton Corporation | Voting Member |
| Byungtae Jang | Kepco | Guest |
| Gerald Ramie | ARC Technical Resources | Vice-Chair |
| Mike Dood | SEL | Voting Member |

I32: A Survey of Protective System Test Practices

Chair: Andre Uribe

Vice Chair: Will Knappek

Output: Report

Established: 05/2015

Expected Completion Date: 01/2023

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.

- a) Officer presiding: Andre Uribe, Vice Chair
- b) Officer recording minutes: Will Knappek, Vice Chair
- c) Call to order at 10:40 am
- d) Meeting was double booked with another WG at 2:30 pm
- e) We had 8 members and guest.
- f) WG discussed the survey results:
 - a. There is a low number of survey participation (38). A goal is set for at least 100 participants.
 - b. WG chair will request IEEE survey committee to extend the survey until May 1st.
 - c. WG will ask the I-Subcommittee to encourage its members that work for a utility to take the survey or those that don’t, to forward the survey to their utility colleagues.
 - d. WG will ask the PSRC Chair, Michael Thompson, for help in distributing the survey to all PSRC members. We discovered that not all PSRC members have received the survey through IEEE.
- g) Meeting adjournment before 11:50 am.
- h) Next meeting location: Las Vegas, NV

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Hello John Doe,

The IEEE PES Power System Relaying and Control (PSRC) Committee is conducting a survey on relay test practices for the utility industry called “**A Survey of Protective System Test Practices**” and has requested that we distribute their survey via the link below. The purpose of the survey is to analyze common practices among utilities and develop a report on their findings to better understand the current state of the industry’s relay test practices.

Eligible participants taking this survey should represent an electric utility in generation, transmission or distribution and be knowledgeable to answer questions about their utilities relay test practices.

We ask that you please follow the survey link within your relevant department to request responses:

https://research.ieee.org/jfe/form/SV_2f0vlnqSnwYnOzs

The survey is currently live and will remain open until Monday, May 1st, 2023.

The analysis and reporting will be based on the aggregate responses. Results from the survey will be used by the relay committee to develop a report analyzing trends and differences compared to the 2001 survey results on relay practices. The summary of the report will be published by the IEEE PSRC website once it has been completed.

If you have any questions or concerns related to this survey, please reach out to Andre Uribe, IEEE PES PSRC Working Group Chair (copied). (andre.uribe@ieee.org)

Thank you!

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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- 01/11/2023 9:20 CDT
- d) Chair's remarks- Current membership, Review of project status, way forward.
- e) Results of call for quorum: 3/3 members present
- 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
 - a. Reviewed edits as a result of comments from the I-Subcommittee vote
- i) Action items
 - a. One more editing pass
 - b. Resubmit to I-subcommittee for ballot
- 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) 09/11/2023 10:10 CDT
- l) Next meeting date and location, May 2023 or WebEx as required

I35: IEEE Std PC37.2 - IEEE Draft Standard Electrical Power System Device Function Numbers, Acronyms, and Contact Designations

Chair: Mike Dood

Vice Chair: Marc Lacroix

Output: Standard

Established Date: January 2016

Expected Completion Date: December 2022

Draft: Published

Assignment: To revise and update C37.2, Standard for Electrical Power System Device Function Numbers, Acronyms, and Contact Designations

The working group did not meet. The document has been published and the WG plans to disband.

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

**HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL
Wednesday January 11, 2023, 2:45 PM EST**

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

Meeting Participants:

| <u>Name</u> | <u>Affiliation</u> | <u>Voting Status</u> (voting member, non-voting member, guest) |
|----------------------|------------------------------|---|
| Chase Lockhart | Burns and McDonnell | Chair |
| Mat Garver | Hubbell (Beckwith) | Vice-Chair |
| Gerald (Jerry) Ramie | ARC Technical Resources Inc. | Voting Member |
| Jim Nimera | S&C Electric | Guest |
| Patrycia Jarosz | IEEE SA | Guest |
| Bill Morse | SEL | Guest |
| Malia Zaman | IEEE SA | Guest |
| Roger Whittaker | Self-Affiliated | Voting Member |
| Todd Martin | Basler | Guest |
| Tony Bell | Ametek | Voting Member |
| Marilyn Ramirez | Qualus | Guest |
| Travis Mooney | SEL | Voting Member |

Time called to Order and Chair's remarks: The meeting was called to order at 2:20pm Eastern Time and introductions were made. This meeting was to establish what remaining objects needed to be addressed before recirculation.

IEEE Policy Reminders (patents and copyrights): These were reviewed, and no objections were made.

Confirm that call for Patent issues was made and record any responses: These were reviewed, and no objections were made.

Topics discussed:

- Discussed a few final comments before recirculating
- Went over changes made in October during our off cycle meeting
- We are making a final few changes and then submitting for recirculation. Hope to wrap everything up by May 2023.

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

**HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL
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Times of any recesses and time of final adjournment: Motion to adjourn at 4:00pm, 2nd was made. Approved by all, meeting adjourned.

Date, time, and location of next meeting: May 2023

I37: C37.90, Standard for Relays, Relay System Associated with Electric Power Apparatus

Chair: Marilyn Ramirez

Vice Chair: William Morse

Output: Standard

Established Date: 2018

Expected Completion Date: 2024

Draft: 2.0

Assignment: Revision of C37.90 Standard. PAR Expiration 31-Dec-2024

Meeting Participants:

| <u>Name</u> | <u>Affiliation</u> | <u>Voting Status</u> |
|-----------------|--------------------|----------------------|
| Marilyn Ramirez | Qualus | Voting Member |
| Travis Mooney | SEL | Voting Member |
| Hani Al-Yousef | Eaton | Voting Member |
| William Morse | SEL | Voting Member |
| Roger Whittaker | Self | Guest |
| Todd Martin | Basler | Voting Member |
| Tony Bell | Ametek | Voting Member |
| Oscar Bolado | Quanta Technology | Guest |
| Galina Antonova | Hitachi Enery | Guest |
| Mat Garver | Beckwith | Guest |
| Zitao Wang | | Guest |
| April Underwood | SCS | New Member |
| Peiman Dadkhah | | Guest |
| Ajmal Saeed | PG&E | Guest |

- Officer presiding: Marilyn Ramirez
- Officer recording minutes: Marilyn Ramirez/April Underwood
- Call to order, approximately 9:20 am Central Time
- General welcome
- The meeting had 6 members, 1 new member and 7 guests in attendance. Quorum was met.
 - September 2022 Meeting Minutes were reviewed and approved.
 - Motion: Bill Morse; Second: Todd Martin

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

HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL Wednesday January 11, 2023, 2:45 PM EST

- Patent slides were shown, no claims were made. Copyright and Participant behavior slides were shown, no claims were made.
- PAR Extension through 2024.
- Discussions:
 - No updates for the IEE-485 review.
 - Update to Clause 7.9 suggestion was noted by Bill
- Action Items:
 - Definitions Section
 - Virtual Meeting will be scheduled for the month of February
 - Review IEE-485 for harmonization with Section on DC Rated Power Inputs
- Final adjournment, approximately 10:00 am Eastern Time.
 - Motion: Tony Bell; Second: Bill Morse

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. PC37.92 is on the RevCom January 30, 2023, agenda and is waiting for approval for publication.

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

Chair: Roger Whittaker

Vice Chair: Todd Martin

Output: Review for revision IEEE C37.90.1

Established Date: September 2018

Expected Completion date: Dec 31, 2024

Draft: 5

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 Wednesday, January 11 at 8:am eastern time in a single session. This was a hybrid meeting with 14 people attending. A quorum was achieved with 10 of 13 voting members present.

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

HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL Wednesday January 11, 2023, 2:45 PM EST

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 Jerry Ramie to approve agenda. The motion was seconded by Mike Meisinger. Agenda was approved.

Minutes from the September 2022 meeting were reviewed. The motion was made Mike Meisinger to approve agenda. The motion was seconded by Jerry Ramie. Meeting minutes were approved.

Clause 5 was reviewed.

During review of 5.4.2 concern was raised about measuring system feedthrough test. The concern was that it might be too time consuming to do at time of each product test. Annex B was reviewed and it was agreed that the test was not excessively burdensome, and will be left in the standard.

Also during review of 5.4.2 a concern was raised that some that it was unclear what needed done as part of validity test. This lead some to thinking they needed to do more testing as result of information in table 1 of 5.4.3. After discussion all agreed the added testing is not required, but that it is easy to not understand as the standard is written. Todd M., Hani A., and Bill M. volunteer to work on proposed wording change to be discussed at next meeting.

The remaining of section 5 was reviewed with no changes suggested.

Annex B as reviewed. No changes were suggested.

Section 6 was reviewed. No changes were suggested.

This completed the meeting. Mike Meisinger made the motion to adjourn the meeting. Jerry Ramie seconded the motion. The meeting was adjourned.

I41: Draft Standard for Electrostatic Discharge Tests for Protective Relays

Date: January 10, 2023 Jacksonville, FL USA

Chair: Steve Turner

Vice Chair: Dan Ransom

Secretary: (open)

Output: Standard

Established Date: September 22, 2020

Expected Completion Date: January, 2023

Draft: 1

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

HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL Wednesday January 11, 2023, 2:45 PM EST

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

1. Officer presiding

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

2. Officer recording minutes

Vice Chair Dan Ransom recorded the minutes in this document.

3. Call to order

Vice Chair Dan Ransom called the meeting to order at 1:02 p.m., Eastern Standard Time, on January 10, 2023.

4. Chair's remarks

Vice Chair Ransom welcomed all to the hybrid (in-person and virtual) 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 committee members met in six, two-hour meetings since our last meeting to address the 85 ballot comments. With the help of IEEE staff (M. Zalman) the proposed standard was re-balloted, closing December 7. He reported that 85 percent responded, with 95 percent approval. There are 20 new comments that must be addressed. The members addressed two of the 20 comments at this meeting.

9. Action items

AI7: Resolve 20 ballot comments—First meeting set to January 27, 9:00 a.m. Pacific Standard Time

AI8: Chair and Vice Chair to check PAR expiration and extend PAR if needed

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 2:00 p.m. Eastern Standard Time.

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

HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL Wednesday January 11, 2023, 2:45 PM EST

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

The next meeting will be in May 2023 in Las Vegas, NV.

I43: Investigate Response to USA Executive Order Regarding EMP Protection

Chair: Angelo Tempone (Presiding)

Vice Chair: Dolly Villasmil

Secretary: Johnny Moore

Output: Report

Established Date: May 11, 2020

Expected Completion Date: 2024

Draft: None yet

Assignment: Write a report to, (1) Investigate and describe EMPs and their likely effects on protection and control apparatus, and (2) Determine and describe strategies generation, transmission, and distribution utilities can utilize to mitigate the effects of EMPs on their equipment.

The meeting was called to order at 17:00 ET on Monday, January 9, 2023 in a Hybrid format.

- a) Introductions
- b) The chair and vice-chair introduced themselves. The meeting opened with 11 members and 16 in-person & remote guests. There were connectivity issues that were addressed at the beginning of the meeting.
- c) Quorum verification: A quorum was not obtained since less than 12 members attended the meeting (under 50%). The May and September meeting minutes could not be approved without a quorum.
- d) Mark Adamiak presented his findings on the EMP paper: “Control House and Relay Design Considerations for EMP Resiliency”
- e) Johnny Moore presented his findings on the Monte Carlo Simulations on EMP impact on equipment inside the Control Equipment Enclosure.
- f) The meeting agenda & minutes will be approved in our next meeting.
- g) Angelo Tempone will share some of the content from the presentations along with the meeting minutes.

The meeting was adjourned at 18:10 ET.

Our next meeting will be in Las Vegas, NV in May of 2023 (time TBD). A room for 30 people will be needed.

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

**HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL
Wednesday January 11, 2023, 2:45 PM EST**

I44: Skills Required to Program, Commission, Test, and Maintain Ethernet Based PAC Systems

Chair: Andre Uribe

Vice Chair: NA

Output: Report

Established: 01/2020

Expected Completion Date: 05/2023

Draft: Ver 5.1

Assignment: Create report on Skills Beneficial to Program, Commission, Test, and Maintain IEC-61850 and other Ethernet Based Protection, Automation, and Control (PAC) Systems.

- a) Officer presiding: Andre Uribe, Chair
- b) Officer recording minutes: Andre Uribe, Chair
- c) Call to order at 5:00 pm
- d) We had total of 13 members and guest.
- e) Announced that Michael Dood is no longer the VC. New VC is to be determined.
- f) Agenda Items:
 - 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...
 - b. A modified report will be issued, and several volunteers have been assigned to peer review.
 - c. WG goal is to have a final draft completed before the September's meeting.
- g) Meeting adjournment before 6:10 pm.
- h) Next meeting location: Las Vegas, NV

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

HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL Wednesday January 11, 2023, 2:45 PM EST

Assignments

- a. January sessions volunteers to contribute.
 - i. Section 1: Karen Leggett assigned to peer review.
 - ii. Section 2: Will Knappek, Marcos Velazquez assigned to contribute.
 - iii. Section 3: David Dolezilek assigned to contribute.
 - iv. Section 4: Karen Leggett Wyszczelski, Peiman Dadkhah assigned to peer review.
 - v. Section 5: Yujie Yin assigned to peer review.
 - vi. Section 5.6: Bharat Nalla assigned to contribute. Austin Wade assigned to peer review.
 - vii. Section 6: Mike Cunnigham, Tim Mathias, Galina assigned to peer review.
 - viii. Section 8: Jonathan Sykes assigned to contribute.
 - ix. Section 9: Mike Cunnigham assigned to contribute.
 - x. Section 10: Will Knappek, Sughosh Kuber assigned to contribute.
 - xi. Section 11: Bharat Nalla assigned to contribute.
 - xii. Section 12: Mike Dood assigned to contribute.
- b. May sessions volunteers to contribute
 - i. Section 5.7: Scott Cooper assigned to peer review
 - ii. Section 5.8: Don Ware assigned to peer review
 - iii. Section 7 & 8: Will Knappek assigned to combine these two sections and make commissioning and maintenance a subset of sec 7. Retitle this section.
 - iv. Section 9: Abel Gonzalez assigned to peer review
 - v. Section 11: Andre Uribe and Adrian Zvarych assigned to contribute
 - vi. Report: Andre assigned to update report to refer to engineer/technician vs single function

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 10:43 AM Eastern
- Check for quorum – 8 Voting Members in Attendance; Quorum Achieved!

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

HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL Wednesday January 11, 2023, 2:45 PM EST

20 attendees total: 12 local, 8 remote

- 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>
- Approve past minutes 1st Don 2nd DJ

Proposed Agenda

- Review-Approve Last Meeting Notes (12/7/2022)
- Status of I45 progress by Adrian Z
- Continue the Report review starting @ Section 4.4.1.1
- @ 5 minute mark – Round Table & **Action Items**
- Motion to Adjourn
- Approve Proposed Agenda 1st Don 2nd DJ

Report Review Comments:

- Reviewed Sections 4.4.1 through and including Section 4.4.2
- Next I45 Meeting
 - Wednesday 1 February 2023
 - 11:30 AM – 12:30 PM Eastern Time
 - WebExs - Online
- Adjourn: 1st 2nd 11:51 AM Eastern

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

Chair: Bruce Magruder (Chair)

Vice Chair: Sudarshan Byreddy

Virtual Meeting/Teams: 10 January 2023, 3:40 – 4:50 PM CST

Output: Revise IEEE C57.13.3-2014

Established Date: September 2021

Expected Completion Date: January 2025

Draft:

- a) Call to order – Bruce Magruder, 3:50 PM CST
- b) Chair's greeting & remarks, a total of 12 participants joined the hybrid (in-person/Webex).

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

HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL Wednesday January 11, 2023, 2:45 PM EST

- c) Agenda was presented and reviewed
- d) Patent slides were reviewed. The attendees did not present any patents requiring further action.
- e) Copyright slides were presented. No comments from the attendees.
- f) As quorum was achieved, Brian Mugalian made a motion to accept the September 2022 meeting minutes and Jim O'Brien seconded the motion.

IEEE C57.13.3 was reviewed and members are volunteered to review the sections for proper word usage and new section assignments as follows.

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

Don Lukach discussed about the new SA template to use for this document. P&P manual is updated under knowledge base at IEEE PES PSRC website.

Motion to adjourn was made by Bruce Mugalian and seconded by James Niemera.

| <u>Name</u> | <u>Affiliation</u> | <u>Voting Status</u> (voting members) |
|--------------------|---------------------------|--|
| Bruce Magruder | SOLV Energy | Chair – Voting Member |
| Sudarshan | Burns & McDonnell | Vice Chair - Voting Member |
| Brian Mugalian | S&C Electric | Voting Member |
| Jim Niemira | S&C Electric | Voting Member |
| Jim O'Brien | Duke Energy | Voting Member |
| Jalal Gohari | WSP Group | Voting Member |
| Shivam Prabhakar | Siemens | Voting Member |
| Lou Garauagua | General Electric | Guest |
| David Elliese | PSE&G | Guest |
| Priya Raghuraman | Siemens | Guest |
| Zeeky Bukhara | GE power | Guest |
| Don Lukach | Ameren | Guest |

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

**HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL
Wednesday January 11, 2023, 2:45 PM EST**

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

Chair: Don Burkart

Vice Chair: Nicholas Kraemer

Secretary: Amir Makki

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: Don Burkart and Amir Makki

Minutes recorded by: Nicholas Kraemer

Meeting was called to order. Pre-PAR patent, copyright, and participant behavior information were shown and discussed; no objections were raised. Quorum was achieved with 6 of 9 members and 11 guests. Craig Preuss motioned to approve the September 2022 Minutes with Amir Makki seconding. Minutes were approved unanimously.

Main discussions and proceedings:

- WG agreed main purpose of work was to (1) provide a common format for documenting changes, and (2), provide a method of authenticating information provided by manufacturers
- Previous title, scope, need, and purpose were presented, along with new Title, scope, need, and purpose proposed by a member to better capture the WGs goals
- Working group modified proposed title to “IEEE Standard Common Format for Documenting IED Firmware or Software Changes and Confirming their Transmittal (COMFIRM)”. Craig Preuss motioned and Gayle Nelms seconded title for use in PAR submission. Passed unanimously.
- Working group modified proposed scope to explicitly include reliability (security and dependability). Craig motioned and Gayle Nelms seconded scope for use in PAR submission. Passed unanimously.
- Members were requested to review newly proposed purpose and need statements and supply comments over email before EOD Monday, January 16th.
- A member of S17 requested to open a discussion on how their ongoing work with SBOMs relates to our work. WG officers to follow up

Amir Makki motioned and Nicholas Kraemer seconded adjourning the meeting. Motioned passed unanimously.

The WG plans to meet again at the next PSRC meeting.

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

**HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL
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I48: Revision to IEEE C37.103: Guide for Differential and Polarizing Relay Circuit Testing

Chair: Mohit Sharma

Vice Chair: Open

Secretary: Open

Output: IEEE Guide

Established Date: January 2023

Assignment: Revise IEEE Std C37.103 - Guide for Differential and Polarizing Relay Circuit Testing

I48 met for the first time as a working group in a hybrid format with 2 attendees in-person and 3 virtual attendees on Tuesday, January 10th, 2023, at 10:40 AM Eastern Time.

Mohit started the meeting with the review of patent and copyright policies. There was no potential claim raised. Mohit then reviewed the existing standard briefly and apprised the attendees of the need of this working group and the time frame for the completion of this standard. The existing standard expires in 2025.

We added 3 members including the Chair.

Action Items –

- Mohit to transfer the existing standard on the latest IEEE SA template and share on iMeet Central for volunteers to start contributing
- Mohit to find out from IEEE SA if AutoCAD drawings are accepted or see if IEEE recommends a tool to update drawings. He will also check with the previous chair if he had any Visio files for the drawings
- Assignments –

Read Section 4 and 5 and suggest improvements – Jim Niemira

Read Section 6 and 7 and suggest improvements – Zitao Wang

Read Section 8 and 9 and suggest improvements – Swagata Das

Read Section 10 and 11 and suggest improvements – Angelo Tempone

Read Section 12, 13 and 14 and suggest improvements – Mohit Sharma

The meeting was adjourned at 11:45 AM ET.

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

HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL Wednesday January 11, 2023, 2:45 PM EST

10. Liaison Reports

- a. Transformers Committee—Will Knappek. Will is Retiring end of 2023. Please contact Ritwik Chowdhury (ritwchow@ieee.org) if you are interested in this liaison role.

The Transformer Committee met the week of October 16th, 2022, in Charlotte, NC.

Highlights of interest:

Instrument Transformer Subcommittee—Here is the plan of standards being developed/maintained by the Subcommittee.

| Standard | Title | Status |
|------------------------------|--|---|
| C57.13 | Standard Requirements for Instrument Transformers | Published 2016 WG active due 12/31/2025 |
| C57.12.2 | Standard Conformance Test Procedures for Instrument Transformers | Balloting Complete in comment resolution |
| C57.13.5 | Standard of Performance and Test Requirements for Instrument Transformers of a Nominal System Voltage of 115kv and Above | Published 2019 Looking into combining with main Std. |
| C57.13.6 | Standard for High Accuracy Instrument Transformers | Allowed to expire 12/31/2020 |
| C57.13.7 | Standard for Instrument Transformers with max output of 250 mA | Published 2018 rev due 12/31/2028 |
| IEC-IEEE 63253- 5713-8 | Standard Requirements for Station Service Voltage Transformers | PAR extended Ballot pool being formed |
| C57.13.9 | Standard for Power-line Carrier Coupling Capacitors and Coupling Capacitor Voltage Transformers | PAR extended Balloting now |

A working group for the C57.13 standard met for the second time. They had 170 comments from the current standard that they are working on. They will be adding information about Extended Range CT's from a Task Force into the C57.13 revision. A Task Force was formed to investigate combining C57.13.5 into main standard.

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

HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL Wednesday January 11, 2023, 2:45 PM EST

The Instrument Transformer Subcommittee asked if the Relay Committee would like to look into Electromagnetic Compatibility of Electronic Instrument Transformers and IEDs. Information was submitted to I Subcommittee chair for review.

There is a TF open that are looking into IT Accuracy. This TF is not considering relaying applications.

In the Power Subcommittee, a WG is working to update the Volts/Hz information.

Next meeting of the Main Transformer Committee meeting is scheduled to meet in Milwaukee, WI the week of March 19th, 2023.

11. Old Business

- a. None.

12. New Business

- a. Need liaison to the Sensors Subcommittee of the Power System Instrumentation and Measurements (PSIM) Committee. Please contact Ritwik Chowdhury (ritwchow@ieee.org) if you are interested in this liaison role.
- b. Discussion on liaison role for Entity Standard Working Group “Guide for Test Sets and Tools for Testing Protective Relays. Electronic ballots to determine need and interest on a possible I Subcommittee Liaison role as a Joint Technical Committee.

13. Other announcements?

- a. None.

14. Motion to Adjourn, by Higginson, second by Knappek Adjourn time: 4:03 PM EST

Next meeting will be in-person in Las Vegas, NV, May 2023.

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

**HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL
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Reference Material:

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

L##: Title of Working Group

Chair: ???

Vice Chair: ???

Secretary: ???

Output: ??? (Paper, Report, Tutorial, Guide, Recommended Practice, Standard, etc.)

Established Date: ??? (Month, Year)

Expected Completion Date: ??? (Month, Year)

Draft: ???

Assignment: ???

The following information should be included in your minutes as appropriate. The working group is free to use whatever form they choose to cover the items from the below list that apply to the meeting.

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

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

**HYBRID IN-PERSON and ON-LINE MEETING – Jacksonville, FL
Wednesday January 11, 2023, 2:45 PM EST**

Proposal for New TF or WG

Date:

Definition of the Problem

What is happening?

What should be happening?

Proposal for Task Force

Submitted by:

J Subcommittee Meeting Minutes, January, 2023, Jacksonville, FL & Webex

J SC met Wednesday January 11, 2023 at 2:45 PM EST with 22 out of 34 members and 20 guests, reaching quorum.

A motion to approve the September 2022 J SC meeting minutes was made by Jason Eruneo and seconded by Derrick Haas. 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 12)

Status: 24th Meeting (1-10-23)

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

Activity:

1. The Working Group (WG) met Jan 10, 2023, with 11 members and 5 guests. In-Person 5 members, 2 guests; Virtual 6 members, 3 guests.
2. Quorum was not achieved so minutes from prior 2 meetings were not approved.
3. The WG assignment was reviewed as well as a brief history of WG activities.
4. The WG reviewed some of the revisions made to Section 9 by Dale and Wayne since the last meeting.
5. Wayne reviewed the location where he had inserted the power equation using LL voltages that Dr. Yalla had submitted. This was placed on page 54 of Section 7 and the WG accepted this insertion point.
6. Wayne introduced reference 11 that he had found and inserted into the report concerning SCT (Short Circuit Torque). This was inserted page 73 of Section 8 of Draft 12.
7. Dale reviewed Section 9 starting on page 84 of Draft 12. He mentioned that the Peak Torque will never be greater than the Peak-to-Peak Torque, however they could be similar in some cases. Tom stated that the negative Torque indicates that the motor is acting as a generator at that time in relation to any other motors that may be present on the bus at that time then after the transfer the infinite bus in the model pulls it back into acting like a motor.

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8. Some brief discussion on the best curve fit section in Annex B ensued where no comments were yet received from the reviewers that had been assigned to review this section, however it will get reviewed when routed for Working Group review and J-Subcommittee review.
9. Motion to adjourn the meeting was made by Jason E. and seconded by Derrick H.

Assignments:

1. Chair to transmit May 2022 and Sept 2022 Minutes to WG members for review/approval
2. Dr. Yalla to check insertion of V-LL power equation on Page 54 and adjust if needed
3. Chair to ensure graphs in Section 9 are properly labeled
4. Chair to place draft report into IEEE format.

Next Meeting:

In Person: Double session, projector, room for 30 people for in-person meeting

Virtual: WebEx or similar from PSRC. 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: 16th Meeting (1-10-23)

PAR Expiration: Dec 2024

Assignment: Revise C37.101 Guide for Generator Ground Protection

WG Report

The WG met with 23 total participants (16 in-person, 7 via Webex), where 14 out of the 22 voting members were present. As quorum was achieved, Ryan asked if someone would like to make a motion to accept the Sept 2022 meeting minutes. Jason made a motion to accept those meeting minutes and Zeeky seconded that motion.

Ryan reviewed the patent slides required for IEEE PAR WGs and he mentioned that the PAR has been extended until 12-31-2024 with projected schedule of the following: 2022/2023 review/edit technical body of guide, 2023 review/edit annexes, and 2024 balloting.

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 reviewed. The working group then proceeded to discuss several topics in more depth:

- Ryan stated that Nader's suggested revisions to the injection schemes section have been incorporated to the guide.
- Reviewed the revised 27TH Section, specifically the reliability and security of this protection and that 59THD may typically be more secure than 27TH.

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- Reviewed the text markup and figure provided by Nader as an example of a VN3 study. The working group decided not to incorporate it for fear of the reader thinking that example would cover all possible bases. A WG member stated that he has pumped storage units in his fleet so in his case the survey includes additional quadrants when the unit runs as a motor. Additional language was added to the paragraph to represent the type of study that is required for element security.
- Ryan will review document for some of the words like “should”, “must”, “shall”, “always”, etc to determine if appropriate as typically they are not.
- 27TN is used in the standard whereas IEEE C37.2 calls it 27TH so document will be reviewed to ensure appropriate the protection is noted as appropriate.
- Figure 13 contains some color so the question is if the final document should be black and white and if so, we will need the native graph used for this figure so it can be addressed. All figures in the document will be reviewed.
- Low Impedance Grounding Section Review: Discussed core balance CT and ground differential section.
 - There was a discussion about how some generators are high resistance (or ungrounded) and connected into a low resistance or solidly grounded system. This is sometimes done in critical applications that require high reliability.
- Discussed the annexes briefly and asked for volunteers to review. Of note, the application used in this Annex differs from the one used in C37.102 and C37.106 – should they all use the same unit? Ryan was leaning towards keeping this section as is with existing parameters.

Motion to adjourn was made.

Next Meeting:

Single session, room for 30 people and a projector. The WG also request no conflict with other J meetings, especially J17 (C37.102). Request meeting on Tuesday or Wednesday.

J17: Revision of C37.102 Guide for AC Generator Protection

Chair: Manish Das

Vice Chair: Gary Kobet

Output: IEEE Guide

Draft: 7.3

Established: May 2017

Status: 21st meeting, January 9, 2023 (hybrid)

Expected completion date: -

PAR Expiration: Dec 2024

Assignment: Revise C37.102 Guide for AC Generator Protection

WG Report

WG met on January 9, 2023 virtually via webex and in person for a double session with attendance recorded from a total of 16 members and 17 guests. Quorum had not met at checking. The Sep 2022 minutes will be approved via email.

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

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Chair shared that PAR extension was approved by 2 yrs to Dec 2024, but WG hopes to complete the work much earlier.

WG continues to resolve SA ballot comments. Out of the 404 comments, 199 have been addressed. A set of 99 comments has been assigned to the CRG (split into 7 groups of 5 reviewers, with each group discussing and helping disposition 14-18 assigned comments). This will help with and expedite the comment resolution. This assignment is due **2/28/23**. Some of the remaining comments are dependent upon these CRG comments being resolved first.

Annex A revision work has been split to two Tasks: 1 – Run the new machine parameters into the 2006 Mathcad files. 2 – place the results and updated plots into the 2006 Word document and review and polish for WG review. This assignment has already been made.

WG goal is to merge all group resolutions, address any remaining comments, and have a redline ready for a recirculation ballot prior to the next PSRC meeting.

Additionally, the WG discussed and addressed the following ballot comments. (See ballot comment spreadsheet for the disposition details):

- *Comment I-178, I-175, I-125, I-33, I-18, I-17, I-16, I-15, I-13, I-12: Accepted*
- *Comment I-131, I-8: Rejected*
- *Comment I-142, I-21, I-19, I-11, I-10, I-9, I-6: Revised*

Next Meeting:

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

J18: Investigate the effects of sub-synchronous oscillations due to inverter based resources (IBR) on rotating machinery protection and control

CHAIR: Normann Fischer

VICE CHAIR: Jared Mraz

Output: Report

Established: September 2017

Status: WG January 10, 2023

Assignment:

Write a report that describe the different types of sub-synchronous phenomena, their causes, and effects on the power system. Investigate the potential Impact on existing rotating machinery protection. Investigate how to detect these events and what mitigation techniques can be applied.

WG Report

Working Group did not meet at January PSRC.

Next meeting:

For the next meeting J18 will need a room for 30 and an overhead projector. Avoid conflicts with J, D29, I4.

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J20: Report on Practices for Generator Synchronizing Systems

CHAIR: Jason Eruneo

VICE-CHAIR: Ritwik Chowdhury

Output: Report (Draft 8.0)

Established: January 2019

Status: 11th WG Meeting, Jacksonville, FL Hybrid January 11, 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

Meeting started with attendees introducing themselves. A quorum was established. Wayne Hartmann motioned and Steve Conrad seconded to approve the May meeting minutes.

Michael Thompson presented a video on synchronizing lamps. There was follow-up discussion. The lamps provide a composite measurement. It is not an exact measurement, but it complements a synchroscope quite well.

Michael Thompson discussed autosynchronizer tuning. There was an issue where the synchronizing was too slow. There was an issue with hunting. He showed an event report:

- Frequency raise and frequency lower commands were being sent. The frequency pulses needed to be set a little less aggressive and slow them down to tune the system.
- Voltage pulses needed to be set more aggressively to help ensure that the voltage magnitude gets into the band fairly quickly.

Michael Thompson showed a settings file describing the different settings. He showed another video where it was apparent on a microprocessor-based relay that the frequency settings were set too aggressively.

- **Action Item: Jason Eruneo** will work with Mike Thompson to incorporate oscillography plots and language into the Appendix

We received 6 ballot votes out of the 16 voting members. We need at least 75% approval to proceed to SC ballot. All voting members are requested to submit their ballots by **February 10**. We plan to setup monthly meetings to address the ballot comments.

- **Action Item: WG members** to submit ballot votes by February 10 Several working group comments were discussed and resolved.
- **Action Item: Gary Kobet** to address comment #69
- **Action Item: Gary Kobet** to address comment #76

Next meeting is planned to be virtual on February 3, 2023. Meeting adjourned at 10:30 AM EST.

Next meeting:

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

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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 (11th meeting January 11, 2023)

WG report

The WG met with 8 members, and quorum was met. 14 local attendees, with 5 members attending in person.

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

September's meeting minutes were approved (Will English motion, Gary Kobet 2nd).

The entirety of the meeting was spent on reviewing a proposed tutorial outline submitted by Gary Kobet for review:

- Per a suggestion by Tom Beckwith, and subsequent discussion the motor bus transfer section will be moved earlier in the tutorial to Section VI.
- Working group debated whether "Thermal Model" needed its own dedicated section. Right now thermal element/model information is distributed throughout the rest of the section in C37.96.
- Working group decided to remove the section on Microprocessor multifunction relays to match the same change that will be made in the updated guide.
- Working group liked the tutorial be largely based on an example case. The example case in C37.96 Annex A was discussed.
- Working group decided a separate synchronous motor example is needed to complement the induction motor example in Annex A of the Guide. This action item was agreed to be brought up to J22, as it was felt that the C37.96 guide itself could use an example synchronous motor.
- Motion to adjourn (Zeeky motion, Gary 2nd)

Action Items:

- Dale Finney and JC Theron took an action item to review the existing material related to thermal element/model in the guide and determine if we needed to add a dedicated section or not.
- 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.
- Derrick and Zeeky took an action item to request working group members of J21 and J22 to get an example synchronous motor (data, details, etc).

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.

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J22: Revision of C37.96, Guide for AC Motor Protection

Chair: Zeeky Bukhala

Vice Chair: Jason Buneo

Secretary: --

Output: Guide

Draft: -

Established Date: May 2021

Status: WG Meeting 8

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 eighth meeting on Wednesday, January 11th, 2023, with 18 (9 in-person and 9 virtual) attendees.

- I. Welcome/Introduction
 - a. The Chair kicked off the meeting at 10:30am EST and welcomed members and guests, this was followed by introductions.
- II. Quorum check
 - a. 11 of 26 members were in attendance. Quorum was not met.
- III. Approval of Meeting Minutes. Quorum not having been met, Chair will seek approval of September and November 2022 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. 7.2.11 Breaker Failure. Discussed and accepted Tom Beckwith's additional paragraph about the need to completely isolate motors under fault including if new breakers close to feed the fault. Those breakers would then need to immediately trip.
 - b. 7.2.6 Device 46, reverse phase or phase balance current relay. Reviewed Andy Kunze's recommendations. Recommendations were accepted with minor edits.
 - i. Expanding main paragraph and removing the two subsections.
 - ii. There was a brief discussion on the difference between unbalance using just the magnitudes of phases vs using the negative sequence current as the definition of unbalance.
 - iii. Discussed thermal heating model with respect to the 46 element.
 - iv. Andy found that a 15% pickup seemed common as a pickup point through different literature, so left that number as is.
 - c. Jason Eruneo comments. Continued reviewing Jason's comments. Jason was unavailable, chairing a concurrent working group meeting.
 - i. 5.1.2 Synchronous motor loss of synchronism (pullout) should be moved to section 7 and have an out of step section made. The change in the language for this section was acceptable by the group.
 - ii. 5.1.3 accepted comments

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- iii. 5.1.4 After extensive discussion it was agreed clause needs to be clearer. Chair will defer to assignee (Derrick Haas).
 - iv. Chair will request assignment owners review their section of Jason's comments and incorporate as appropriate for improved efficiency.
 - d. Tom Beckwith asked for assistance updating Figure 44. Chair confirmed that native files are unavailable, and figure will need to be redrawn. This is a larger challenge that Chair is seeking a solution to.
- VI. Next Steps.
- a. Chair reminded working group to complete assignments and upload output to iMeetCentral. Chair will begin consolidating comments to begin drafting D1 of the guide.
 - b. Next meeting. May 8th-11th, 2023. Las Vegas meeting.
- VII. Adjournment. Meeting Adjourned at 10:30am EST.

Next meeting:

Double session with accommodations for 30 people and a projector is requested. Also request no conflict with J15, J20 and J21. Schedule J22 to immediately precede J21.

J23: Report on Generator Condition Monitoring

Chair: Steve Turner

Vice Chair: Rob Messel

Secretary: Open

Output: Report

Established Date: May 2021

Status: (1-11-23)

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.
- 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

Vice Chair called the meeting to order at 8 am on January 11, 2023.

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Attendance included 10 members and 1 guest. Quorum was met. The Sep 2022 minutes will be approved via email.

Ellery Blood motioned to approve the agenda and J.C. Theron seconded the motion.

Vice Chair presented information from the patent and copyright slides.

Motion to approve minutes from the September 2022 meeting was made by Ellery Blood and Lauren Brandt seconded the motion.

Outstanding writing assignments are as follows:

1. Actual fault develops and schedule maintenance – No progress to report.
Bracy Nesbit
Dale Finney
2. Describe and develop guidelines for online condition monitoring of large synchronous generators, including salient-pole rotors as well as cylindrical rotors – No progress to report.
Rob Messel
Bracy Nesbit
3. Provide information on online condition monitoring techniques as well as recommending thresholds to trigger alarms and initiate remedial or compensating action – No update provided as those assigned were not present.
Steve Turner – APS
Jay Mearns
Abel Gonzales - Megger
4. Demonstrate how to use specific the protection functions to monitor generators – No progress to report.
Steve Turner – APS
Sungsoo Kim – TRC Engineering
JC Theron - GE
5. Describe mechanisms of degradation and applicable monitoring devices.
Ellery gave a Power Point presentation titled P26 condition monitoring. His presentation started with definitions for a fault and a failure, moved into discussing detecting faults and then showing a chart of when machines fail. He then compared condition-based monitoring with periodic maintenance. There was a short discussion where motors have current signature analysis done to calculate fault frequencies. The question was brought up if we can do this for a synchronous condenser. Rob summarized what he had heard in the presentation as there is a lot done for monitoring the health of generators and looking for changes or trends. Bracy mentioned that his utility monitors the health which takes all this information into another system where it creates a health index and is used to help determine when to take an outage and what work is performed.
Ellery Blood – SEL, Inc.
6. Pilot projects to explore this technology – update provided as those assigned were not present.
Steve Turner – APS
Dale Finney - SEL

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Vice chair will discuss with chair the need to send a reminder email between meetings to assure progress is being made on assignments. Vice Chair will also approach chair regarding the use of PSRC sharefile space for keeping working documents.

Next meeting:

Single session with accommodations for 25 people is requested. Also request no conflict with J

J24: Report on Synchronous Generator Disturbance Recording

Chair: Shane Haveron

Vice Chair: JC Theron

Secretary: open

Output: Report

Established Date: September, 2021

Expected Completion Date: January, 2026

Draft: -

Assignment: Establish a working group to publish a document on the use of disturbance recording for synchronous generators and critical associated auxiliary systems which will include: Digital Fault and Dynamic Disturbance Recorder basics, NERC disturbance monitoring and reporting requirements (PRC-002), detection of events and oscillations, and creation/handling of data files.

WG Report

The working group met on 01/10/2023 at 3:40 pm EST with 11 people in attendance, 3 of which were online. 3 out of 5 voting members present, achieving quorum.

Proposed agenda and minutes from September meeting were reviewed and approved, moved by Derrick Hass and seconded by JC Theron. Participant behavior, patent, copyright, and WG assignment were reviewed with no comments.

Derrick Hass will 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. J23 condition monitoring may also be of interest.

A discussion was held on the kinds of signals that are measured for synchronous generation and also how derived measurements are made and for what purpose. It was pointed out that Dynamic Disturbance Recording (DDR) could be based on synchrophasor data.

The Vice Chair volunteered to start writing sections addressing generation measurements and oscillations. The Chair gave a summary of the report and will continue to develop the structure and add disturbance recording basics. When sections have been identified, volunteers will be invited to contribute to the report and guests were invited to become members or corresponding members.

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

Next meeting:

Single session with accommodations for 20 people is requested.

Please avoid conflicts with H46, H52, PSCC S15 and all J, particularly J21.

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J25: Report on Synchronous Condenser Protection

Chair: Jason Eruneo

Vice Chair: Dale Finney

Secretary: open

Output: Report

Established Date: September 23, 2021

Status: 4th WG Meeting, Jacksonville, FL Hybrid January 10, 2023

Expected Completion Date: January, 2025

Draft: 1.3

- **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 14 in-person attendees and various virtual attendees. There was a check for quorum and a quorum was established.

Russ Patterson motioned and Zeeky B. seconded to approve the September meeting minutes.

Normann Fischer provided the WG with the results of an out of step analysis for a synchronous condenser

- The analysis began with a review of the variables within the swing equation and how they apply to a synchronous condenser
 - The mechanical torque variable within the swing equation is zero for a synchronous condenser. This translates to the electrical torque being equivalent to the windage losses in the machine.
- The initial system consisted of a synchronous condenser connected to a line and equivalent power system.
- A fault was placed on the line and the response of the synchronous condenser was recorded and oscillography provided (MVAR output, MW, voltage, current, angle difference between the internal generator voltage and the generator terminal voltage)
- The results displayed that the synchronous condenser voltage difference oscillates between approximately +/- 26 degrees. Therefore, it was concluded that the synchronous condenser does not slip poles
- The second system added a synchronous generator in parallel with the synchronous condenser of the initial system.
- The same fault was applied from the initial system analysis
- The results displayed that the synchronous generator began to go out of step and slip poles. The synchronous condenser voltage swung with the synchronous generator; however, it did not slip poles.
- The WG agreed that we should reach out to generator manufacturers expressing our analysis results in an attempt to verify that a synchronous condenser cannot slip poles
- Russ P. raised a question as to whether we should contact the manufacturer to ask them to confirm that a SYNCON OOS cannot occur.
 - **Action Item: Zeeky B. and Robert M.** will reach out to their perspective companies for a response.
- **Action Item: Jason Eruneo** will send a copy of the presentation to the WG

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The WG discussed a presentation related to a synchronous condenser and the impacts to frequency response in weak grid system topologies

- The presentation showed results that align with the WGs thought that the addition of a flywheel on a synchronous condenser will provide more system inertia and support the system frequency rate of decay and frequency nadir. However, the results also showed that in a weak grid the system frequency recovery will be slower due to the additional MWs absorption needed from the addition of the flywheel. The thought was that slower frequency recovery could potentially have a negative impact on something like an underfrequency load shedding scheme

The WG discussed whether a generator relay or a motor relay should be used on a synchronous condenser.

- The WG concluded that it depends on how the synchronous condenser is started as to whether they should use a generator relay or a motor relay.
- Additional discussion may be needed since it was expressed that not all motor relays offer a loss of field function

Next meeting:

Single session. With room for 30 and a projector. Request no conflict with J17, J20, K31.

J26: Summary Paper - Modeling of Generator Controls for Coordinating Generator Relays

Chair: Juan Gers

Vice Chair: Phil Tatro

Output: Summary Paper

Established Date: January 12, 2022

Status: 3rd WG Meeting January 10, 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 with 10 in person and 10 virtual attendees, out of them, 9 members and 11 guests. A quorum was achieved.

Minutes of the September 13, 2022, meeting in Nashville were approved.

The group discussed the merits and challenges of producing a transaction paper versus a conference paper. The discussion was focused on the amount of new material that would be required and the limitation on length if the paper was to be accepted as a transaction a paper. On counsel of the subcommittee chair, the group agreed to remain consistent with the working group assignment to produce a summary of the J13 report. If the working group would like to prepare a transaction paper with new material, a request will be made to the subcommittee to form a new working group upon completion of the J26 assignment.

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Juan Gers reviewed a power point presentation that provide details on the content of the paper. The slides will be used as a guide for drafting the summary paper. Juan will update the slides to remove references to new material to reflect the narrower focus of this assignment. Examples will be included in the summary paper; however, the examples will be the same as the J13 report with some modeling differences.

Mike Basler presented a RTDS case study of a 5 MVA generator connected to a 69 kV line. This case study provides insight into the possibilities of including RTDS simulations in a transaction paper, should the working group decide to pursue this upon completion of the summary paper. RTDS simulations with generator controls and protective relays included as hardware-in-the-loop could be used to show the impact of modeling generator controls on dependability and security of generator protection settings.

As next steps, Juan Gers will update and distribute the power point presentation from this meeting. He will work with interested members to convert the power point slides into a working draft of the report and distribute to the working group within two months. The working group will review the draft at the May 2023 meeting with the objective of having a final draft at the September 2023 meeting.

Next meeting:

Single session with accommodations for 30 people and a computer projector is requested.

Please avoid conflicts with J17.

J27: Summary Paper - Revision of C37.106, Guide for Abnormal Frequency Protection for Generating Units

Chair: Bracy Nesbit

Vice Chair: Jay Mearns

Output: Summary Paper

Established Date: May 11, 2022

Status: 2nd Meeting January 10, 2023

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: 3 members and 7 guest attended. 8 people in-person and 2 people virtually

- Reviewed Sept 2022 minutes. No comments or changes.
- Discussed this is a summary paper and not a standard; however, we intend to follow all IEEE Policies.
- Reviewed Additions to paper:
 - Jason
Scenarios that cause excessive V/Hz
Describe the damage resultant from V/Hz
 - Ritwik
Show the minimum continuous capability limits from C57.12.00. Explain the associated voltage rating and voltage drop effects. How different manufacturers provide no-load vs full load etc.
 - Bracy

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V/Hz Reset: Rob Messel clarified the actual core interlaminar insulation thermal damage mechanism. Rob also opined that moderate thermal damage exposure is more impactful to an older machine versus a new machine.

Effect on Generator and capability: discussed added phrase on aged winding components...WG to review and consider.

Effect on Turbine and capability

General Comment from members – Figures in the presentation must be clear and may need to be larger (10-point curve in Figure-3 difficult to see clearly). Also, may need to look at color graphics.

- New Assignments:

Bracy

Other Considerations (Rob Messel agreed to review)

Summary

- Existing assignments to for paper sections are still in progress

Jay

Abnormal Frequency Protection

- Protection Methods. Over/underfrequency, accumulator, torsional mode protection.
- Supervision
- Tripping Practices
- Load Shedding, Regional requirements, and Coordination Considerations

Raju

Annex A – Steam Turbine Generator

Derrick

Annex B – Hydraulic Turbine Generator

Voltage Transformer Capability Requirements

Doug

V/Hz Supervision

V/Hz Tripping Practices

- Rob Messel mentioned the accumulative effect on generator damage. He will investigate the 2 hour suggested trigger to inspect machine.
- The initial plan is to be prepared to present paper at the Texas A&M Conference and later at Georgia Tech Conference.
- Derrick will research on the paper page requirements
- Follow-up TEAMS meetings will be scheduled to get the paper ready for submittal by early summer 2023.

Next meeting:

Single session. With room for 20 and a projector. Please avoid conflicts with J15.

J Subcommittee Meeting Minutes, January, 2023, Jacksonville, FL & Webex

JTF28: Prepare J6, J14 Papers for Publication

Chair: Zeeky Bukhala

Vice Chair: Open

Established Date: May 11, 2022

Status: Task Force 1st Meeting January 10, 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 first meeting on Tuesday, January 10th, 2023, with 9 attendees (7 in-person and 2 virtual).

- I. Welcome / Introductions
 - a) The Chair kicked off the meeting at 2:25pm EST and welcomed attendees to the task force's first meeting followed by introductions.
 - b) Chair provided some background as to the task forces assignment.
- II. J6 (Protection issues Related to Pumped Storage Hydro (PSH) Units) Update
 - a) Dale Finney went through proposed changes to the report.
 - b) Any text that was copied from the 1975 paper was re-written maintaining original purpose.
 - c) A paragraph was added to the Introduction referencing the 1975 paper
 - d) Sections 3 and 4 were simplified by referencing C37.101 and C37.102 where content was similar to the guides.
 - e) JC Theron raised the point that hydro units can experience overspeed events as high as 200% of rated which most digital relays cannot track. After some discussion it was agreed that this would not affect Pump Storage Units.
- III. J14 (Plant Protection Issues Associated with Black Starting of Generators) Update
 - a) Chair is preparing package for Technical Writer
- IV. Next Steps
 - a) J6:
 - i. Dale will complete the edits discussed during the session and send to Chair.
 - ii. February 17th, 2023 – Task Force comments due to Chair
 - iii. February 28th, 2023 - Submit edited paper to Subcommittee for approval
 - b) J14
 - i. January 30th, 2023 – Assign editing task to Technical Writer
 - ii. March 31st, 2023 – Distribute edited document to Task Force for approval
 - iii. April 30th, 2023– Task Force comments due to Chair
 - iv. May 12th, 2023 – Submit edited paper to Subcommittee for approval
 - c) May 8th-11th, 2023 – Next session at the Las Vegas meeting.
- V. Adjourn – Meeting adjourned at 3:30pm.

Next meeting:

Single session. With room for 10 and a projector. Request no conflict with J15, J20, J21, J22.

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Liaison Reports:

Electric Machinery Committee – M. Yalla – No report.

Industry Applications Society (IAS) / Industrial & Commercial Power Systems (I&CPS) – D. Haas - Standard 3004.8, "Recommended Practice for Motor Protection in Industrial and Commercial Power Systems", which was just highlighted in IAS magazine, is up for PAR. PAR approval was in 2022. Lorraine Padden is the WG chair. As J subcommittee is revising C37.96, recommend coordination with this working group.

Nuclear 1E WG – P Kumar – IEEE 741-2022 was issued last summer. This latest version addressed the CRITERIA for protection considering any power-quality issue, including effects of an open-phase. 741 will be putting together a new PAR to address more detailed open phase guidance, similar to that of the IAEA guide or that of the PSRC K11 report.

Old Business:

None.

New Business:

Membership Updates – At his request, Ratan Das will be removed from J Subcommittee membership as he is not able to regularly attend. Chris Ruckman, Luis Polanco, Michael Reichard and Sudhir Thakur are no longer members. Jared Mraz was welcomed as a new J Subcommittee member.

Presentations – Michael Thompson shared a video showing the use of synchronizing lights to aid an operator in synchronizing a small hydro generating unit to the system. Joshua Hughes shared an event with out-of-phase synchronization due to incomplete commissioning practices.

Adjournment:

Motion to adjourn was made by Jason Eruneo and seconded by J.C. Theron. Meeting was adjourned at 4:05 PM EST.

K Substation Protection Subcommittee Meeting Notes, January 11, 2023, 4:15 – 5:35 CDT - Hybrid

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**
- **Check for quorum (23 out of 31 members, need 16 for quorum), quorum was made**
- **Approval of agenda (Kamal Garg motioned, Pratap Mysore seconded, approved unanimously)**
- **Approval of previous meeting minutes (Jeff Barsch motioned, Paul Elkin seconded, approved unanimously)**
- **Advisory Committee items of interest**
 - Encourage members to
 - participate/attend other non PSRC-PSCC WG during JTCM.
 - Co-present a Lunch & Learn session so we can learn about other committees working group's products.
 - Let Kathy Dalton (for marketing and PR purposes) know if your WG has completed its work.
 - 2022 version of P&P for standards and P&P for WG are published. Download and familiarize.
 - Statistics : PSRC 267 + PSCC 103 + more outside PSRC/PSCC, new comers TBD.
 - New SA online mandatory trainings (fundamental and anti-trust) to all WG chair, VC, and secretary. 60 days to complete. You will receive an email.
 - PAR WG Chair only, to check and update your project profile in MyProject with your current chair, vc, and secretary names and email addresses.
 - PSRC moving back to in person only for May and September 2023. WG that need to have hybrid meetings will have to arrange for their own communication setup. No support will be provided from PSRC. You still need to let us know your schedule so the physical room can be reserved.
 - Future Lunch and Learn sessions will be done without remote access capability.
 - May 2024 meeting, confirmed in Buffalo, NY.
 - PES Call for Webinars; contact Mike Thompson if you are interested.
 - Member Planet web service still going to be the member database. More to come.

Working Group Reports:**K12: PC37.431.20 IEEE Guide for Protecting Transmission Static Shunt Compensators**

Chair: Satish Samineni

Vice Chair: Martin Best

Secretary: -

Output: Guide

Established Date: 2013

Expected Completion Date: 2023

Draft: 26

Assignment: To work jointly with Substations WG I9 to write a guide for protecting transmission static shunt 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 compensators.

PSRC WG K12 and Substations WG I9 had a hybrid meeting on Tuesday, January 10th, 2023. K12 had 3 members present. Quorum was not met.

Joe M. Warner, Vice Chair of Substations WG I9 gave an overview of the current draft and we continued where we left off from the last web meeting.

We addressed comments from the following sections:

- Definition for DRPC
- Corrected acronyms and abbreviations
- Corrected Definitions
- 6.2 Voltage Transformer Considerations
- 7.4 Medium Voltage Bus Protection
- 10.0 Testing of DRPC control and protection systems
- 11.0 Transient Fault Recorder
- Annex B
- Annex C
- Worked on HV Breaker consideration for DC offset

Current version of the draft is D26.

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 via a Virtual/Face-to-Face Meeting on 01/10/2023
- Officer presiding – Rick Gamble
- The meeting was called to order by the Chair
- Introductions were made
- The meeting was attended by 10 members and several guests
- Quorum was not met
- Chair reviewed the Patent, Copyright, and Participation Behavior Code of Ethics slides

Discussion:

Mat Garver assigned as Vice Chair & Brandon Lewey as Secretary

Recommended to request a PAR extension September 2023

Discussed Capacitor Bank Unbalance Protection Calculations and Sensitivity Analysis paper and inserting into the appendix of the Guide

Action Items:

- Chair to request a PAR extension during September 2023 meeting
- Chair, Vice Chair, and Secretary to meticulously review the Guide after SA Editorial to ensure no equations or values were re-worked and incorrect
- Chair to receive latest draft of Guide which has been converted into the new template by SA Editorial
- Author of Paper is required to signed LOA, which is a permissive document allowing the WG to use the Calculations in the Referenced Paper

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 3.32, MEC Draft Copy****Assignment: Revise and update the C37.109 Guide****Meeting Notes:**

1. Introduction and agenda (40 participants and 14 voting members). Reached quorum (Total 19 working group members). Minutes were showed from November 02, 2022. These will be approved via email, since motion was not done, however no objection was recorded for minutes of meeting dated November 02, 2022.
2. Copyright. Participant behavior and Patent slides provided via email in meeting invite. Patent slides were briefly discussed during the meeting.
3. MEC provided comments on 1/8/2023. K26 appreciates the help from Malia and MEC to get these documents back after MEC review before the meeting. Following are some minor observations from MEC. Some items (in red) red will be done before final circulation.
 - a) Copyright form – Done.
 - b) Draft number cannot have two digits after decimal – Draft number for ballot V3.4
 - c) If possible, convert equations to Microsoft or MathType. If not done during ballot stage, will be done during final circulation. – Ilia and Kamal are discussing this with MEC and if can done easily will convert to equations, otherwise will be done later – Some of this resolved with IEEE editors. Remaining will be done during ballot review process.
 - d) Some word usage correction will be done before final circulation process.
4. Ballot body formed and ballot invitation closed on 1/9/2023. Draft posted for review on 1/20/2023.
5. Presentation on Ground Faults Tertiary Reactors, dry type reactors resistor and PT sizing by Pratap. Good discussion, it was agreed to add a comment by Gary Kobet during the ballot stage. No addition will be made for now.
6. Kamal and David presented the table for Dry type reactors and Annex F. David described various protection elements for different dry type reactors designs. K26 members felt the table presented is useful, but this will be added before ballot. During ballot stage comments this will be discussed and added as needed.
7. Figure F1 citation missing, and text says BH curve rather than VI curve- Citation added. Other changes during ballot resolution.
8. It was agreed since draft just went through MEC, any additional changes/updates/corrections will be included during the ballot comments resolution stage. Additional meetings will be arranged as needed after the receipt of ballot comments.
9. Additional correction in Bibliography was briefly shown and it will be included in the ballot document.
10. Meeting adjourned 4.40 PM EST.

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: 1, November 4th 2022****Assignment: Review and update C37.95 IEEE Guide for Protective Relaying of Utility-Consumer Interconnections****11th WG Meeting**

1. Welcome
2. Patent and Participant Behavior Slides –
 - The patent slides were presented, and no one responded with a patent challenge.
 - Participant Behavior Slides were discussed with the WG.
3. Quorum : 12 /21
4. Approve Agenda
 - Motion/Second: Jeff Barsch/ Steve Conrad
 - None opposed.
5. Approve Minutes from September 2022 and July 2022 meetings
 - Motion/Second: Lubomir Sevov/Jeff Barsch
 - None Opposed.
6. Follow up on Assignments Received
 - 6.1.2 Backup or redundant protection
 - Section 8.4.3 Anti-Islanding Ted Warren and Juan Piñeros
 - Discuss we removed “delta-Star” from text
 - 4.3.11 - Dean Miller
 - Dean Miller re-write received. Paul Elkin will add some additional text for discussion.
 - Section 9 – Suggested addition by Juan Piñeros
 - Section 7 – Gopal Gajjar
 - Pending: New Assignment from July Meeting on IBR for section 7
7. Continue Guide Editing
8. Plan Web Meeting
9. Adjourn
10. Motion/Second: Ted Warren/ Jeff Barsch

Notes:

- Brandon Davies and Lubomir Sevov will review and update section 6.1.2 Backup or redundant protection
- Agenda items for Section 9 and Section 7 will be discussed in our next working group meeting.
- WG reviewed assignment by Lubomir Sevov on section 9. WG agreed to edit repeated text as proposed by Lubo. Hillmon and Paul will incorporate in latest draft.
- In discussion, an error was highlighted in in Figure 20 on the T1 protection. 51GT1 protection is shown duplicated, once of them should be 87GDT1. We made a note to fix during our figure review. WG to consider adding a note for restricted earth differential if appropriate at that time.
- Gopal Gajjar volunteered to review section 4.
- Working group agreed to use the term “consumer” consistently. Hillmon and Paul to update as part of the ongoing language review.
- Aim to ballot by EOY to make our target date.
- We two interested individuals in joining the WG and collaborating. New members will be registered as non-voting member and elevated to voting members when meeting assistance requirements are met.

K29 WG: Write PES technical report based on K3 report entitled ‘Reducing outage durations through improved protection and autorestation 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: December 2023****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**

K29 met Wednesday, January 11th 2023 at 9:20 CT with total 13 attendees, 4 via Webex and 9 in person.

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

With 6 voting members the Quorum was reached, and we were able to approve the sept 22 minutes of meeting.

We had a presentation by Rafael Garcia about Oncor Auto-restoration scheme with feeder transfer and bus Tie automation for 2, 3 and 4 transformer substation configurations.

We had a renewed interest in feeder downstream automation inclusion, the chair invited to submit the related contribution and the Chair will serve as a liaison with the D subcommittee.

All attendees were informed that draft 0 of the report was emailed on 1/9/2023 to all members.

The meeting adjourned 1st Don Ware, and 2nd Sudarshan Byreddy.

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: 1.1****Summary:**

The WG met with 34 attendees, with 11 of 18 voting members. Quorum was met. One person showed interest to join. Meeting minutes will be distributed for approval via email.

- Agenda was presented and reviewed - No updates or suggestions were made to the agenda. Motion was made by Gene Henneberg, seconded by Taylor Raffield. No discussion or oppositions was presented, motion carried and the agenda was approved.
- Patent Slides were presented, no patents were identified
- Copyright and Attendee Ethics slides were presented reviewed
- PAR Purpose and Scope were reviewed
- Approval of September and October web meeting minutes was completed via email
- Meeting room request for 30 attendees. Request to avoid conflict with WG C26 and C50

Details:

- Chair reviewed status of section reviews and updates.
- Vahid asked for volunteers for outstanding sections.
- There was a discussion of how to handle failure to closer for generation (section 6.15.6) vs failure to close series capacitor bypass breaker. Presently, section 6.15 (and subclause 6.15.6) are specific to generator and associate breaker failure., Mike Thompson commented that these two schemes are fundamentally different and do not share many commonalities and that it may make sense to create a separate section. There was a general consensus about leaving section 6.15.6 as is, and creating a new section.
- The group discussed what was to be covered in the “Integrated BF Schemes”. Report K5 “Ancillary Protective and Control Functions Common to Multiple Protective Relays” was referenced in the discussion. Yujie Yin discussed his contribution related to material in the K5 Report and information that he has proposed to be included in the Clause 7 and a reference is made to the paper.
- Mike Thompson made a motion that pertinent material and figures from the K5 on “Ancillary Protective and Control Functions Common to Multiple Protective Relays” be moved into guide to act as a standalone content in the K31 guide with Bibliography reference to the K5 report so users will not have to refer to the original source report. Chris Walker seconded, no discussion or objections were made and all WG members approved. The motion stands.
- Mike Thompson suggested that he may have the native Visio files of the K5 figures and offered to look for the files and follow-up with Dean Miller if he was not able to locate the files.
- Vahid opened a question to the working group on their thoughts on next steps for the report. Vahid suggested that review teams or subgroups are made to provide a final review of each of the sections.
- The Chair asked the volunteers for the new assignments to commit to turning their contributions prior to March 1.

Motion to Adjourn Adi Mulawarman, seconded by Gene Henneberg.

New Assignments (Due 2/28/2023):

- Section 5 Review – Hillmon Lander-Garcia
- Section 6.5 – Taylor Raffield, Arunodai Chanda
- Section 3.1 – Steve Klecker (would review section 3.1 and will let Chair know if he needs additional information)
- Failure To Close – Series Capacitors - There is room for volunteer (s) who would like to help out in authoring this section, let the Chair know.

Liaison Reports:

T&D Committee, Capacitor Subcommittee, **Pratap Mysore,**

<http://grouper.ieee.org/groups/td/cap/>

- IEEE 18 in Balloting
- IEEE 1036 almost ready for ballot
- New committee working on LV Capacitors
- Paper almost complete on capacitors used for GMD blocking for transformers

Old Business

None

New Business

IEEE PES PSCCC-E0 Sub Comm P367 looking for additional participations from PSRC for inputs on revising the fault current calculation and example in their standard. The meeting will be mostly online, if interested email Adi/Brandon. **(P367 – IEEE Recommended Practice for Determining the Electric Power Station Ground Potential Rise and Induced Voltage from a Power Fault)**

Items of General Interest

Sebastian Billaut provided a presentation impact of high penetration of IBR to transformer inrush.

Adjourn

Rick Gamble motion to adjourn; Steve Conrad seconded.