



**POWER SYSTEM RELAYING AND CONTROL COMMITTEE
of the IEEE POWER AND ENERGY SOCIETY
MINUTES of the MEETING in Las Vegas, Nevada, USA**

May 8-11, 2023, In-Person Meeting held at Flamingo Hotel, Las Vegas, NV

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

Chair Michael Thompson, called the Main Committee meeting to order at 7:36 AM (PDT) on Thursday, May 11, 2023.

Following tradition, attendees introduced themselves. First time attendees reintroduced themselves and were recognized. A quorum check was conducted and verified that quorum was achieved. There are 135 Main Committee Voting Members, down to from 136 with resignation of Marc Benou earlier in the week. The PSRC thanks Marc for his dedicated service over the years and wishes him well in his future endeavors. Quorum requires 50% for groups larger than 50, so 68 Voting Members constitute quorum. There were 71 Main Committee Voting Members present of 135 Main Committee Voting Members. Attendance was recorded via in-person sign-in sheets. Attending this Main Committee meeting were 142 people in person, 71 MC Members and 71 guests.

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

REMINDER:

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

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

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

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

Chair's Report - Michael Thompson

The May 2023 joint meeting of the PSRC and PSCC Committees in Las Vegas, NV, was a great success. This was the PSRC's first fully face-to-face meeting since the global pandemic. We are pleased to report that the attendance was in line with typical attendance prior to the pandemic. We had 260 participants including 26 newcomers. The break down in participants at this meeting is shown below.

Committee	Returning	New Comer	Total
PSCCC	10	3	13
PSRC	144	17	161
Both	80	6	86
Total	234	26	260

The PSRC and PSCC plans to continue meeting three times per year in January, May, and September. The PSRC plans to continue to support hybrid meeting format (both in-person and remote participation) at the January meeting which is administered for us by the PES as part of the Joint Technical Committee Meeting (JTCM). For the two meetings that are administered as in-person format, individual working groups may separately arrange for remote participation on an as needed basis. The PSCC plans to continue to support hybrid meeting format at all three of their meetings.

The PSRC is making an effort to improve the amenities associated with our in-person meetings. As we all know, the hospitality industry suffered greatly during the pandemic with the result that meeting costs have gone up considerably. We will continue to refine our approach to find a happy medium between registration fees and amenities. We hope that you found the Las Vegas meeting an enjoyable experience.

The roll out of the PES's new membership management system, MemberPlanet, is behind schedule but coming along. All members, participants, and interested individuals of the PSRC have been asked to create a profile in the system. If you have not done so, please do this as soon as possible. You can find a link on the membership page of our website, pes-psrc.org. We are hopeful that we can start using the system to communicate with participants, track rosters and participation, and collaborate on our important work by our next meeting in September.

I am continually amazed at the amount of work that this committee is accomplishing. Your passion for improving the most critical of infrastructure, the electric power system, is evident in the contributions that you make to the work of the PSRC Committee. I am thankful every day to call you colleagues and friends. Thank you to everyone for making our May 2023 meeting a successful meeting. I look forward to seeing you all in Myrtle Beach, SC, for our September meeting.

Sincerely,

Michael Thompson

II. Approval of Minutes / Financial Report: Jim Niemira

Minutes of the January 2023 hybrid PSRC meeting have been posted to the PSRC website for review. A motion to approve the Minutes of the January 2023 hybrid meeting as posted was made by Andre Uribe and seconded by Hugo Monterrubio. A motion to Amend the posted Minutes was made by Gary Kobet and seconded by Greg Ryan. The Amendment is to add Minutes from the January 2023 meeting of WG J24 Report on Synchronous Generator Disturbance Recording to the Minutes of the January PSRC Meeting, contingent upon approval of the addition of WG J24 Minutes by the J SC. The WG J24 Minutes were late in arriving and were not included in the posted January 2023 PSRC Minutes. The Motion to Amend was approved unanimously. The Motion to Approve January 2023 Minutes as

Amended by adding WG J24 Minutes, contingent upon their approval by J SC, also passed unanimously.

POST MEETING UPDATE: The J SC approved their revised J SC Minutes of January 2023, including addition of the Minutes from WG J24, via email ballot. The PSRC Secretary correspondingly revised the PSRC January 2023 Minutes to include WG J24 Minutes, and the FINAL Minutes of January 2023 PSRC as revised will be posted to the PSRC website.

In person total registration for both PSCCC and PSRC for the May 2023 meetings is at 260, an increase of in-person registration from 172 in person in January 2023. The May 2023 meetings were in person only, although some WG and the PSCCC also supported on-line attendance. On-line attendance is not recorded in the registration statistics. Total registration for the May 2023 meeting (in person only) is down slightly from January's total registration of 298 (including both in person and on-line attendees). Refer to the Chair's report for breakdown of attendance statistics for the May 2023 meeting.

The PSRC committee financial status is healthy. Registration fees were not increased for the May 2023 meeting in Las Vegas and the meeting was run at a significant planned deficit in order to spend down surplus reserves. The goal is run meetings near revenue neutral where fees are reasonable and adequate to cover expenses while maintaining an appropriate operating reserve that will cover emergencies. Fees for future meetings will be adjusted in accordance with anticipated revenues and expenses.

Many thanks to meeting sponsor Commonwealth Associates for contributions towards refreshments for the meetings.

Also, thanks so much to those who donated use of projectors for the meetings.

Association Management System Update – Gene Henneberg

PSRC Participants had been asked to create a profile in the IEEE PES CMS (Committee Management System) hosted by memberplanet by April 22, 2023. As of first week of May 2023, about 40% of Technical Committee participants have created their memberplanet profiles.

As of the May PSRC meeting, 388 PSRC participants have created profiles.

If you haven't created your profile, please do so. It is required to update you on PSRC activities and maintain voting member status on any roster.

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

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

Committee Dashboard anticipated rollout is planned for June 5, 2023.

The post-dashboard feature rollout is a work in progress.

We anticipate recording some Webex training, so live meeting attendance won't be necessary.

POST MEETING UPDATE FROM ABIRA ALTVATER:

- *MemberPlanet: All committee participants should have created an account in MemberPlanet, the deadline was April 22nd, but committee participants can continue to create their profiles. After this, we will give the stragglers some time to create profiles, and within a*

few weeks of that, we will ask EACH committee chair, subcommittee chair, task force chair, working group chair, etc to upload their rosters in MemberPlanet. MemberPlanet will then match the rosters uploaded to the people who created their profiles and committee dashboards will be created. Eventually, you'll be able to do meeting registrations here as well. Immediately, after committee rosters are uploaded and created, committee chairs/admins can use MemberPlanet to send emails out to their committees and more. We'll also have MemberPlanet integrated with IEEE Siebel (IEEE's Membership database) in Q3 or Q4 2024. MemberPlanet let us know that there will be a slight delay in building out the Committee Dashboard till about 6/5.

- Roadmap: PES is putting together a roadmap, and we have a rep from each Tech Committee on the Task Force, and if anyone is interested in participating, they can reach out to Abira and Abira will get them added to meetings/listservs
- If anyone is interested in doing a PES webinar on a topic related to PSRC, please submit a form <https://app.smartsheet.com/b/form/127ee5dbb2044d62bd13bcbb02e5fe57>
- Reminder to submit any upcoming PSRC meetings here <https://app.smartsheet.com/b/form/01a6f83af2e34fdc91c8fa1b6b0826bd> so we can add to our PES calendar and advertise via email and social media.
- PES Technical Activities has 4 shared WebEx accounts, let Abira know if access is needed
- Technical Activities resources and templates are on the PES website: <https://ieee-pes.org/technical-activities/resources/>
- PES puts out Trending Tech emails, where a PES Technical Committee talks about their activities, PSRC is scheduled for June with Jonathan Sykes as the lead

Post Pandemic Meeting Plans and Future Meetings – Gene Henneberg

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

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

Future PSRC meetings:

September 18-21, 2023, Myrtle Beach, SC, DoubleTree Resort Myrtle Beach Oceanfront

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

May 13-16, 2024, Buffalo, NY, Hyatt Regency Buffalo Hotel and Conference Center

September 2024, TBD

2025 – 2026 Just starting to think about those.

There was a request to have more west coast meetings. It was pointed out that PSRC Meetings are spread across the USA, west, central, and east. Recent meetings have been Reno NV (west), Nashville TN (central), Jacksonville FL (east), Las Vegas NV (west).

III. Reports of Interest

A. Technical Paper Coordinator's Report: Gene Henneberg

GM 2023 (In Person Meeting, July 16 to 20, Orlando, FL)

- 4 PSRC 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
- 21 Papers Accepted
 - 2 papers nominated as the best PSRC papers
 - 6 papers selected for the paper forum

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	Will English	Bruce Magruder	Veselin Skendzic
Eric Allen	Dale Finney	Amir Makki	Charlie Sufana
Abu Bapary	Ken Fodero	Ken Martin	Phil Tatro
Jeffrey Barsch	Fred Friend	Peter McLaren	Ian Tualla
Tony Bell	Rick Gamble	Rene Midance	Steve Turner
Minum Bin Gani	Gene Henneberg	Dean Miller	Eric Udren
Joerg Blumschein	Michael Higginson	Bhaskar Mitra	Benton Vandiver
Oscar Bolado	Ted Hlibka	Pratap Mysore	Ilia Voloh
Sukumar Brahma	Juergan Holbach	Mukesh Nagpal	Michael
Gustavo Brunello	Ali Hooshyar	Jim O'Brien	Thompson
Ritwik Chowdhury	Richard Hunt	Dean Ouellette	Don Ware
Steve Conrad	Tony Johnson	Manish Patel	Ted Warren
Ratan Das	Kevin Jones	Mahendra Patel	Roger Whittaker
Brandon Davies	Bogdan	Russ Patterson	Zhiying Zhang
Alla Deronja	Kasztenny	Qun Qiu	Karl Zimmerman
Kevin Donahoe	Gary Kobet	Farnoosh	
Mike Dood	Bruce Mackie	Rahmatian	
Paul Elkin	Vahid Madani	Dan Sabin	

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.

PES GM 2024 Preliminary Super Sessions

Where does your subject of interest fit?

- Grid operation/planning for uncertainty
- Changing power system dynamics
- Use of AI in the power grid
- Public acceptance/perception of power grids

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

Three new WG were approved by the Technical Council for start in 2023:

- “Obsolescence Management for Protection, Automation and Control” (B5.81) , Convenor John Wright (john.w.wright@ge.com).
- “Education, Qualification and Continuing Professional Development of Engineers in Protection, Automation and Control” (B5.82), Convenor Mladen Kezunovic (m-kezunovic@tamu.edu)
- “Protection for modern distribution networks” (B5.83), Convenor Tang Yi (tangyi.bh.sd@vip.163.com)

Each WG has already several US representative, so if someone is interested in participating and is a CIGRE member, please contact John McDonald, CIGRE USNC VP, Technical Activities, at johnD.mcdonald@ge.com

Preferential subjects for SC B5 for the next Paris meeting in Aug 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)

The next US CIGRE NC Meeting 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 May 2023: Eric A. Udren (TC 95 Technical Advisor, USNC)

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

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

US Technical Advisory Group to USNC for TC 95

- Eric Udren, Technical Advisor to US Natl. Cmte. of IEC (hosted by ANSI) & Chair of PSRC I4 - hosts TAG doc reviews
 - Normann Fischer, Deputy TA and Vice Chair of I4
- Financial & admin support for US & USNC work in TC 95 standards:*
- US DOE - Pacific Northwest National Laboratories (PNNL)
 - Jeff Dagle, PNNL, TAG Administrator
 - PNNL covers ANSI fees and keeps US engaged in IEC TC 95 standards.

STANDARDS PROJECTS

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

- 60255-1 Ed 2 - *Common Requirements*
- 60255-26 Ed 4 - *EMC requirements*
- 60255-27 Ed 3 - *Safety requirements*
- These standards impact product designers and manufacturers.
- PSRC WGs and IEEE equivalents aligned.
- Our IEEE–IEC alignment effort since 2000:
 - Comparable type tests should have the same test setups and procedures.
 - Align test levels and values – differences only as clearly justified.
 - Result – vendors and labs can run one set of compliance tests for both IEC and IEEE standards – *huge cost, efficiency, and product reliability benefits*.
- Revision coming in 2023-24 - 60255-21-1,2,3 – *Mechanical tests* – merging into new 60255-21.

100 Series functional and product performance standards:

- 60255-187-3 – *Functional standard for line differential relays* – Committee draft (CD) just available.
 - PSRC restarted D34 to review (Fischer).
 - 87L channel issue guide in separate project TS 60255-216-3.
- 60255-187-2 – *Functional standard for busbar differential relays* – *delayed to finish 187-3*.
- 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 included.
- Projects 187-2 & -3 *cancelled* by IEC due to 5-year limit but can be reinitiated by vote from National Committees coming in June – restart and pick up work.

200-series application guides

- 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 for correct operation in support of 87L function during various power system conditions considering data loss, corrupt data bits, changes of latency, asymmetric latency, path interruptions and re-routing, and jitter or packet delay variation (PDV).

- Development underway with US and Canadian participants.

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

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

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

- IEC Standards can only have numbers
- Latter items have no numbers or acronyms.
- All this is schematic and prospective – not project plans

- TC 95 - PSRC JWG for 60255-24/C37.111 dual logo COMTRADE underway – PSRC H54. *Next example of new collaboration after 60255-118-1 IEEE/IEC synchrophasor standard.*
 - Prior COMTRADE versions were coordinated informally under the table.
- WG3 on *Functional requirements for the protection of direct current (DC) transmission and distribution networks* is underway.
 - USNC can propose experts until **May 19** – *DC protection experts wanted.*

TC 95-PSRC standards collaboration summary

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

**E. SC21 and IEEE 1547: Ben Kazimier
SC21 Liaison Report**

SC 21 Working Group Updates:

IEEE P1547.2: 1547 Application Guide - In recirculation ballot. Expected publication late 2023

IEEE P1547.3 / PSCC S13: 1547 Cybersecurity Guide - Is on May 15th RevCom agenda for approval

IEEE 1547.9: 1547 Energy Storage Guide- Published in Aug 2022

IEEE P2030 Revision: Smart Grid Interoperability Guide - Slow start – will need PAR extension

PAR for revision of IEEE 1547.4-2011

Section 1

1.1 **Assigned Project Number:** IEEE P1547.4

1.2 **Type of Document:** Guide

1.3 **Life Cycle:** Full Use

Section 2

2.1 **Project Title:** IEEE Guide for Design, Operation, Integration, and Interoperability of Intentional Electric Power System Islands

Section 3

3.1 **Working Group:** (auto filled)

3.2 **Sponsoring Society and Committee:** SC21

3.3 **Joint Sponsor:** none

Section 7

7.1 **Are there other standards or projects with a similar scope?** Yes

There are several standards that cover topics that are relevant to IISs.

IEEE 1547-2018: Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces.

IEEE P2030.12-(date TBD): Draft Guide for the Design of Microgrid Protection Systems

Need for a revision to IEEE 1547.4-2011:

- **Important.** Averaged 1227 views per year.
- **Inactive.** IEEE 1547.4-2011 became inactive on 12/31/2021.
- **Needs an update.** Since 2011, the deployment levels and complexity of intentional-island systems (IISs) have increased, and the maturity of the industry has grown immensely.
- **Coordination with base standard.** IEEE Std 1547-2018 includes a new clause 8.2 on DER Intentional Island Systems (IISs). Need to coordinate with that clause.
- **Stand-alone power systems.** There is a need for guidance for planners and operators of permanently-islanded or stand-alone power systems. Because most of the off-grid aspects of an IIS will be common with a stand-alone power system, IEEE 1547.4rev will provide and highlight such guidance.

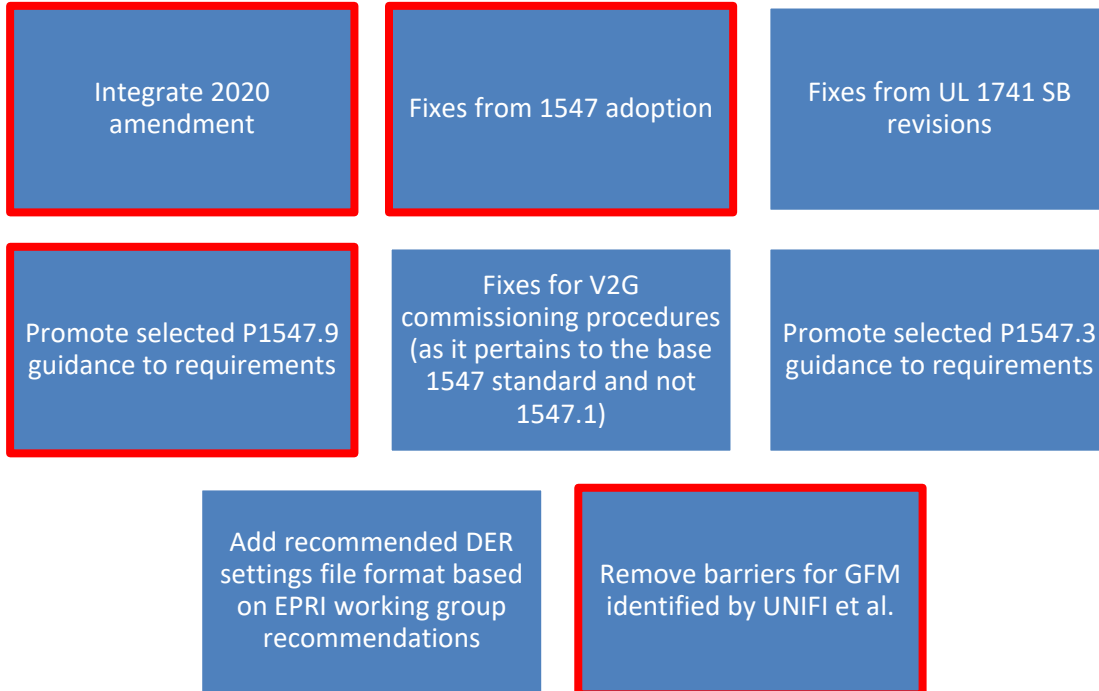
Timeline: Study Group formed 10/2022; PAR submitted 4/2023; NeSCom decision on PAR 5/15/2023; WG kickoff (if approved) 10/23 Portland, OR; expected ballot 6/2026; expected submit to RevCom 6/2027. Will proceed faster as possible.

More info or to get involved: contact the 1547.4 Chair Dr. Michael Ropp at:

meropp@sandia.gov

IEEE P1547 – Revision to IEEE Std. 1547-2018

- **Focus of this Revision towards IEEE 1547-2025**



Sources: 1547 Revision Study Group Tracker, EPRI Tracker, UL1741 Industry Task Group, rejected IEEE 1547-2018 ballot comments, others?

- **IEEE 1547-2018 Protection Challenges**
- **Protection Challenges with DER**
- Protection Challenges of DER with IEEE 1547-2018 (including field experience)
 - Coordinating protection with Ride Through
 - Short Circuit (rotating machines contribute, inverters limited)
 - Configuration of Interconnection System
 - o Transformer
 - o PCC recloser
 - o Open phase conditions
 - High Penetration of DER
 - o Load Rejection Overvoltage
 - o Ground Fault Overvoltage
 - o Islanding
 - o Reverse Power Flow (substation, feeder, recloser miscoordination)
 - o Protection coordination
 - o Fault duty
- **IEEE 1547-2018 Revision WG Key Issues Impacting IEEE PSRC**
- Clearer Demarcation between IEEE 1547 vs. IEEE 2800
- Provide protection performance requirements similar to IEEE 2800
- Need to define better DER Models from manufacturers based on usage including protection
- Clearer guidance on Ride-Through Requirements. Ride-Through is a capability, Trip settings is the degree to which it is utilized.

Proposed Protection Language for Consideration to be Included in Clause 6.5.2.1 of the IEEE 1547-2018 Revision: *Protection schemes shall not limit the DER plant's ride-through capability with the following exceptions: Faults within the DER plant that cannot be cleared except by disconnecting the DER plant from the Area EPS. Faults outside DER Plant(s) that would result in tripping Area EPS or BPS protection devices that would leave the DER(s) as the only source(s) to the fault.*

Discussion in Sub-Group#3 on Abnormal Conditions of IEEE 1547-2018 of Proposed Language: *Ride-Through requirements in 1547-2018 can, and have been, interpreted to unnecessarily require a Ride-Through response for some Area EPS and BPS faults. The intent of the additional text is to clarify circumstances where Ride-Through is not required, or desired. The proposed text intentionally does not prescribe how a utility implements protection on the BPS and Area EPS but clarifies conditions where Ride-Through is not required.*

IEEE 1547-2018 Revision Working Group Sub-Committees

- **Rotating Machines Task Force (TF 1)**
- Vehicle-to-Grid Task Force (TF2)
- SG1- Overall Document
- SG2- Normal conditions, voltage regulation
- **SG3 - Abnormal conditions**
- SG4 - Interoperability & Cybersecurity
- SG5- Special Interconnections
- **SG6- Modeling & Simulation**
- SG7- Test Specifications & Requirements
- **SG8- Power Quality**

How to Subscribe to IEEE 1547 WG Sub-Groups

- **Sign-up to the IEEE 1547 Working Group Sub-Groups listserver for meeting invitations and discussion**
 - To join the SG1 listserv, send an email message to listserv@listserv.ieee.org
 - In first line of email body, write:
SUBSCRIBE STDS-P1547REVWG-SG1 <Last, First name>
 - For example, "**SUBSCRIBE STDS-P1547REVWG-SG1 Freeman, Daniel**"
 - Subject line of e-mail does not matter (can keep empty or put in anything)

Need and Stakeholders

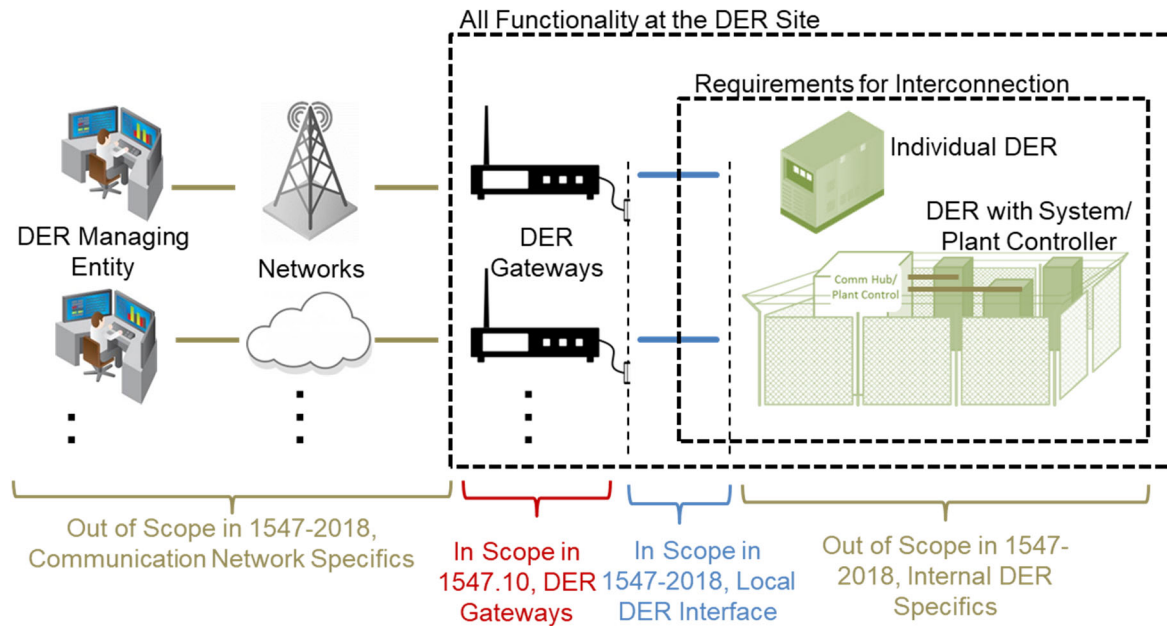
- **Need for the Project:** The smart inverter functionalities specified in IEEE 1547-2018, and the associated communication interfaces are not suitable for direct integration with the monitoring and control systems of grid operators. The standard inverter functionalities were designed only to expose the raw, inherent capabilities of the DER, but (intentionally) omitted additional logic or management features because these were believed to vary by utility and region. This gap can be addressed by deploying a DER gateway platform with a range of grid edge-intelligence functions that provides opportunities to improve system functionality as grid needs evolve over time.
- **Stakeholders for the Standard:** DER vendors, DER communication system providers, DER aggregators, DER gateway providers, utilities, grid operators.

Upcoming IEEE 1547-2018 WG Meetings 2023

Summer: 1547-2018 Rev. WG Meeting July 10-14 2023 (Tentative Dates) (Virtual Only)

Fall: 1547-2018 Rev. WG Meeting October 2-5, 2023 Host: Portland General Electric
Wilsonville, OR (In-person & Virtual)

Definitions – see graphic below



P1547.10 scope and P1547 revision

Need to define a DER Gateway

Should be distinct from other entities which might seem to have similar functionality (e.g., microgrid controller, plant controller)

Need to focus on functionality, irrespective of physical implementation

Load management may need to be considered

What would be the controlling entity for DER gateways?

Reconcile roles

Should not be solely an extension of utility DERMS/ADMS systems

Need to explore use cases/ application for grid-edge intelligence

Should not define new requirements beyond base standard, only provide recommendations

Work Organization -How to Join

Sub-Group 1 : Overall Document and General Requirements

- Mailing List: STDS-P1547-10-SG1@LISTSERV.IEEE.ORG
- [Click here to sign up for SG1 listserver](#)

Sub-Group 2 : DER Grid-Intelligence Functions in Gateways

- Mailing List: STDS-P1547-10-SG2@LISTSERV.IEEE.ORG
- [Click here to sign up for SG2 listserver](#)

Sub-Group 3: Security Functions in Gateways

- Mailing List: STDS-P1547-10-SG3@LISTSERV.IEEE.ORG
- [Click here to sign up for SG3 listserver](#)

Sub-Group 4 : Communications

- Mailing List: STDS-P1547-10-SG4@LISTSERV.IEEE.ORG
- [Click here to sign up for SG4 listserver](#)

Meetings

- First 1547.10 WG meeting took place in April 2023 in Houston, TX

- Most Sub-Groups agreed to meet monthly, on-line meetings started.
- 1547.10 WG meetings will be joint with 1547 WG and proposed for
 - Early Summer 2023 (on-line only)
 - Fall 2023 (in person, West Coast US)
 - Spring 2024 (tentative in Atlanta, GA)
 - Summer 2024 (tbd)

F. Standards Coordinators Report: Don Lukach, PSRC Standards Coordinator

This report summarizes the status of PAR related projects as of the May 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 was changed to only include specific training and not the lengthy WG Chair training. IEEE SA is the lead on all the training and provides the notifications and tracking of all affected individuals.

Main Committee PAR Submissions:

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

WG and SC Chairs continue to do great processing PARs!

C32.92 and C37.106 are now Published.

C37.110 is complete and will be published soon.

Fantastic!

PSRC Standards

65 to 70 Standards

39 Active PARs

10 PARs due in 2023.

1 Entity with PSRC Lead

6 Joint Committee PARs with PSRC in non-Lead role

>9 different organizations within IEEE and others like IEC

PAR Status

Please refer to **Addendum A** of these Main Committee Minutes for more details of status.

Tables include: Completed PAR Projects; Projects Under Consideration; PAR Status; Joint PAR projects with PSRC in Non-lead role, All PSRC Lead PAR Projects

The O&P is under revision. Comments? Send to Standard Coordinator.

PES Template

Process like the P&Ps

Expect on-line discussions around August for PSRC vote in September.

Reviewing EPM (Entity) processes.

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

PSCCC held 27 WG meetings, 3 subcommittee meetings

99 registrants for PSCCC or “Both”

5 newcomers

C0 – Power Line Carrier

IEEE PC57.13.9 – Standard for CCVT’s has gone to ballot and is in comment resolution (Transformers Committee)

WG has received comments for which it seeks PSCCC input
PSCCC seeks PSRC input (I-SC?) on some points:

What is the **minimum and maximum power frequency** considered from the perspective of relays? IEC CVT standard defines nominal power frequencies as 16.66 Hz, 50 Hz, 60 Hz, and 400 Hz. IEEE CBT standar allows only 60 Hz nominal Relevant clause about minimum and maximum frequency from IEC 61869-5 (CVT) will be revised and 16.66 Hz and 400 Hz were introduced only recently in 61869-1. (General requirements for instrument transformers) wich currently is in Final Draft International Standard (FDIS) stage (meaning no major changes expected, but still possible). Also below is current language about frequency range proposed in IEEE C57.13.9 Draft 17.

What are the requirements from the relay's perspective for transient response in CVTs? In C57.13.9 draft there are two classes defined, but we do not know if the 25% residual secondary voltage after half cycle, the 10% residual voltage after one cycle, and the 2% residual voltage after 2 and 3 cycles, and 0.6% residual voltage after 4.5 cycles is good enough. Below are requirements proposed in the IEEE C57.13.9 Draft 17. This table is also being considered for the new revision of IEC 61869-5 (CVT)

Table 13 -Transient response classes

Time as % of T_P (% of cycle)	% residual secondary voltage	
	Class T1	Class T2
50	-	≤ 25
100	≤ 10	≤ 10
200	< 10	≤ 2
300	< 10	≤ 2
450	< 10	≤ 0.6

Note: T_P designates the period of the ideal sine wave of the primary or secondary voltages. It is calculated ad $T_P=1/f$, where f designates the power frequency. At 60 Hz power frequency $T_P=16.6(6)$ ms and at 50 Hz $T_P=20$ ms.

F0 – Fiber

- IEEE Std 1591.4: Standard for Testing and Performance of Hardware for Optical Phase Conductor (OPPC)
A new standard created by F0
Will request to go to ballot
- Will request *to form a study group* to look at end-of-life criteria of aerial fiber optic cables
- Will request *to form a study group* to produce a technical guide for Fiber Optic Strands integrated into Cables and used for Sensing Applications

P0 – Protocols & Architecture

- WG P10 – IEEE-P2664 Standard for Streaming Telemetry Transport Protocol *will request to go to ballot*

S0 – Cybersecurity

- WG S2 – IEEE P1711.1, Serial SCADA Protection Protocol (SSPP) Guide for using Secure SCADA Communications Protocol (SSCP) and Serial SCADA Protection Protocol *will request to go to ballot*
- Newly formed WG S18 *will request co-sponsorship (with I47) of C37.231: Recommended Practice for Microprocessor-Based Protection Equipment Firmware Control*

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

H. NERC Report: Rich Bauer

Nothing to report this time.

I. Other Reports of Interest

No other reports this time.

IV. Advisory Committee Reports: - Michael Thompson**B1: Awards and Technical Paper Recognition Working Group**

Chair: Andre Uribe

Vice Chair: Mal Swanson

Secretary: Miguel Rios

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

WG Members:

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

Our May PSRC Awards Ceremony took place this last Monday during our welcome reception.

- Awards announced or presented included:
 - Outstanding Standards Awards
 - WG K16 - IEEE C37.91-2021
 - WG D28 - IEEE C37.230.2020-2022
 - Outstanding Technical Report Awards
 - WG C32

Our next PSRC/PSCC Awards Ceremony will be in:

Myrtle Beach, SC

Monday May 8, 2023

DoubleTree Resort by Hilton Myrtle Beach Oceanfront

During our Monday Reception starting at 6:30PM

**Standards WG Awards/Certificates – TRIVA QUIZ:**

Who initiates the IEEE Standards Association Working Group

Awards to request certificates of appreciation once it has been completed and the standard has been approved?

THE WORKING GROUP CHAIR OR VICE CHAIR

Where do you initiate the request?

THROUGH THE IEEE SA AWARDS WEBSITE:

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

How do you initiate the request?

Provide Your Working Group information

Include: Your Name | You Contact Number | Your Email Address

Award Date - Allow six weeks for processing

Uncollected Awards List

- Of the **165** uncollected awards
- **121** awards were delivered via postal mail
- **27** uncollected awards were not located

Farel Becker	Ljubomir Kojovic	Dan Nordell	Sudir Thakur
Patrick Carroll	Rich Liposchak	Mahendra Patel	Demetrios
Randy Crellin	Yuri Luskind	Madhab Paudel	Tziouvaras
Dale Fredrickson	Vahid Madani	Elmo Price	Joe Uchiyama
Jim Hackett	Zach Makki	Farjollah Soudi	S.S. Venkata
Mohamed Ibrahim	John Miller	Gary Stoedter	Lifeng Yang
Gerald Johnson	Krish Narendra	Michael Stojak	

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

2023 Prize Paper Award Nominees

- Calling for nominations!!!
- If it has been published, it qualifies
 - If you're a PSRC Member and have authored and published a paper within the previous 3 years, with a cutoff date of Sept 30 we want to hear from you!
- Deadlines for the nomination September 1, 2023

Minutes of the B1 WG Meeting:

Met Monday, May 8, 2023 – 3:40 – 4:50 PM PDT,

In-Person: Flamingo Las Vegas, Room: Reno Number 1

1. Introductions/New Members
2. Discussion and Approval of Jan 2023 minutes
3. Review of awards to be delivered during our May PSRC Awards Ceremony
4. 2023 SA Standard Medallion Award
 - A. Members were assigned to sponsor nominees.
 - B. Mal Swanson will send out awards criteria.
5. Old / New business
 - A. 2023 Prize Paper Awards – come to the Sep meeting with nominees.
 - B. 2023 SA Individual Awards
 - i. Mal pointed out that we need to know the person meet criteria before nominate a person. He suggested some names and awards.
 - ii. Hugo proposed we focus on Standard Awards. 5 nomination where done in the past years. Requires letter of endorsement, minimum 3 but better if the candidate have 5 letters. Letter endorsement from the chairman is recommended.
 1. Example: “Standard Medallion” Requires the individual to be active and have a record of contribution.

2. 5 names proposed and sponsors assigned.
- iii. Come prepared to review potential nominees.
6. Adjournment

B2: Fellows Award Working Group

Chair: T.W. Cease

No report.

B3: Membership Working Group

Membership Activity Report - May 11, 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 May 8 meeting was 246, which is a good recovery from hybrid meeting during the past 2 years..

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

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

B4: Long Range Planning Working Group

Chair: Murty Yalla

The WG met on Monday 5/8/2023 10:40 AM PDT with 3 members (Bob Dempsey, Bob Pettigrew, Mike McDonald).

WG B4 took up the task of creating a memorial web page on the PSRC website to remember and honor PSRC committee long-time contributors who passed away.

B4 chair will work with PSRC committee past chairs to collect and compile the list and place them on the website.

The meeting was adjourned at 11:20 AM.

Submitted by Murty Yalla

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. O&P is being revised. PSRC Member review and on-line discussions in August for acceptance vote at the September PSRC meeting in Myrtle Beach, SC.

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

No report.

B11: SC21 Distributed Recourses Standard Coordination

Chair: Benjamin Kazimier

Vice Chair: Mat Garver

Output: Standard Coordination

Established Date: September 15, 2022

Expected Completion Date: Undetermined

Draft: N/A

Assignment: Coordination of SC21 & P1547 standards

Meeting Participants:

<u>Name</u>	<u>Affiliation</u>	<u>Voting Status</u> (voting member, non-voting member, Participant)
Benjamin Kazimier	Bender	Chair
Mat Garver	Hubbell (Beckwith)	Vice-Chair
Wayne Stec (Virtual)	Distregen	Voting Member
Steve Conrad	Retired	Voting Member
Juan Gers	GERS USA	Voting Member
Chip Christmann	Basler Electric	Participant
Daniel Sabin	Schneider Electric	Participant
Sean Carr	ComEd	Voting Member
Manish Patel	Southern Company	Participant
Dr. Mike Ropp (Virtual)		Participant
Galina Antonova (Virtual)		Voting Member
Mark Siira (Virtual)		Participant

Tony Seegers	Ameren	Participant
Deepak Maragal	Power Eureka	Participant

Time called to Order and Chair's remarks: The meeting was called to order at 8:04am Eastern Time and introductions were made.

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

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

Times of any recesses and time of final adjournment: Motion to adjourn at 9:11am, 2nd was made. Approved by all, meeting adjourned.

Date, time, and location of next meeting: September 2023, Myrtle Beach, SC
MMR: Request that B11 not be scheduled during D43 & D47 as there was conflict with members and thus attendance.

Topics discussed:

- Wayne Stec gave update on 1547.2; Application guide, recirculation ballot expected to get final ballot approval in the coming months. The plan is to publish by end of 2023.
- Mark Siira gave update on 1547.3/PSCC S13; it is on Revcomm agenda for May 15 and likely to be approved.
- Mike Ropp gave update on 1547.9; explained that this guide is for the application of 1547 to energy storage and that it was published in late 2022.
- Mike Ropp explained that 2030.4 is on the agenda of Revcomm for June 15 meeting Update – covers automation systems and DERMS per 2030.
- Doug Housman is chair of P2030 - Scheduling subgroups, it is running behind, is going to need a PAR extension.
- Robbie Simpson is chair of 2030.5.
- Mike Ropp gave update on 1547.4; gave a rundown of the presentation for the standard; he explained that the standard deals with Islanded / Microgrid systems; On Nescom agenda for May 15th to approve the PAR.
The scope and purpose has changed slightly.
Is not coordinated with 1547-2018. Will address intentional area-EPS islands introduced in 1547-2018. It will also address systems with no connection to any larger EPS - Permanently islanded, stand-alone systems
Became inactive in Dec 2021
Hoping to be approved by Jan 2027
First meeting intended to be held co-located with 1547 meetings in Oct 2023 in Portland,OR
Was discussed to make a recommended practice but ultimately decided to keep it as a guide
- Sean Carr introduced himself as the liaison to the 1547 standard for the PSRC.
- Sean gave a presentation on the 1547-2018 revision
Mike Ropp made the comment that grid forming inverters (GFI) are coming and NERC is poised to impose regulation requirements for them. This will cause a shift in protection challenges. Tony Seegers said Ameren is requesting GFI even though still using as grid-following.... Current protection has not changed.
Next meetings for 1547
 - July 10-14 2023 – 100% virtual
 - Oct 2-5 @ PGE in Portland virtual and in person

CHAT Discussion:

[8:40 AM] Ropp, Michael Eugene

One of the key challenges where GFM will make a major difference is load rejection overvoltage. That's a serious issue with high penetrations of grid-following assets but much less so with grid forming.

[8:41 AM] Ropp, Michael Eugene

Islanding detection is another--Sean just mentioned this.

Rotating Machine TF is led by Mike Ropp:

Would like to have volunteers from PSRC

Chair of EMC is registered to attend

There may be some issues with I2 during ride through and prescriptions within C50.13/.14 - there is an exception in 2018 that Machine capability overrides 1547-2018.

- Discussed conflicts between 1547 ride through requirements and the rotating machine standards C50.13/.14.
 - Ridethrough requirement would cause a scenario where rotating machines could have circulating current that violates standard C50.13/.14.
 - 1547 revision seeks to improve and harmonize this topic.
- Galina gave a presentation on 1547.10
 - Explained that standard is for DER gateway platform in grid applications
 - Mentioned that the definition for gateway is not finalized
 - Show slide for joining sub-groups with the URLs
 - meeting monthly
 - Meetings are co-located with 1547 revision
- Open Discussion
 - Mark Siira - System restoration and black start / resiliency: looking for a list of standards being worked on or published withing the PSRC.

Action Items:

- Sean and Galina to update B11 prior to next the PSRC meeting.

V. Subcommittee Reports to the Main Committee:

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

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

“C” Subcommittee Report – System Protection

Chair: Michael Higginson

Vice Chair: Manish Patel

Refer to C SC Minutes for complete report.

Met on May 10, 2023, and attained quorum; attendance figures will be in the C SC Minutes

New member: Ali Hooshyar

Standards Projects Status Updates

C26: C37.233 Guide for Power System Protection Testing

On RevCom May agenda

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

SC review complete, pending resolution of comments

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

Summary Papers: Subcommittee Review Complete

C25: Protection of Wind Electric Plants

Resolving comments

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

Resolving comments

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

Comments resolved, ready for review by PSRC officers

WG C44 Assignment Update

Assignment: Prepare a summary paper for IEEE Transactions on Power Delivery based on the contents of the report prepared by the C24 working group.

Chair: Sukumar Brahma

Vice Chair/Secretary: Evangelos Farantatos

Update on Task Forces

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

Did not meet, will meet in September as a TF

CTF52: Investigate interest in revising C37.246 IEEE Guide for Protection Systems of Transmission-to-Generation Interconnections

Consensus on need of revision, will meet in September as a TF to discuss scope, purpose etc.

CTF53: 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

appears that there is some interest, working on an outline, will meet in September as a TF to complete an outline and recommendation to SC

“D” Subcommittee Report – Line Protection

Chair: Meyer Kao

Vice Chair: Alla Deronja

Refer to D SC Minutes for complete report.

Met on May 10, 2023; met quorum - 30 members present out of 44

14 Active Working Groups within the D-Subcommittee

IEEE Standards Documents – D-SC

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

*WG currently working on revision

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

Chair: Kevin Jones, Vice-Chair: Normann Fischer

Joint survey with C29 Power System Testing Methods for Power Swing Blocking and Out of Step Tripping WG. Contact Normann Fisher (normann_fischer@selinc.com) if you want to participate in the survey.

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

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

Has not reached 3/4 approval criteria

D30 is working resolving comments from the D-Subcommittee balloting.

D35: Evaluation of Transmission Line Pilot Protection Schemes

Chair: Rick Gamble, Vice-Chair: Brandon Lewey

Paper ready for D-Subcommittee balloting

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

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

Has reached 75% approval criteria.

Addressing and resolving comments from the D-Subcommittee balloting

Will be ready to be submitted to PSRC officers for approval and publishing

NEW TFs

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

Chair/Vice Chair: Bogdan Kasztenny/Normann Fischer

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

Chair: Gregory Gyan

“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 May 10, 2023, with 21 Members and 22 guests. Did not establish quorum.

H SC currently has 17 active Working Groups (WGs) and two Taskforce: 9 are producing or revising IEEE PSRC Standards. HSC also has three members serving as external liaisons.

The following PAR extension requests motions were presented to the HSC:

H27 - IEEE C37.251 Standard File Format for IED Configuration Data (COMSET). M. Capuozzo

H41 - IEEE Revision of 1646 Communication Delivery Time Performance Requirements, D. Dolezilek

H46 - IEEE Recommended Practice for Human-Machine Interfaces (HMI) used in Substation Automation Systems, M. Black

The following WG motioned to form a balloting committee:

H45 - PC37.300 Guide for Centralized Protection and Control (CPC) Systems within a Substation. R.Das

Motion approved electronically by HSC in April 2023.

HTF55 Task Force HTF55 Investigate Distributed Cyber Physical Assessment for Grid Resilience motions for approval to distribute their report to the H SC.

“I” Subcommittee Report – Protection and Control Practices

Chair: Ritwik Chowdhury

Vice Chair: Angelo Tempone

Refer to I SC Minutes for complete report.

I SC met Wednesday, May 10, 2023, in a Hybrid meeting with 27 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 January 2023

Presently 19 Active WG

WG updates of note:

I32 – Survey relay test practices

Received 112 survey responses! Thanks to everyone who responded!

Using the 81 qualified responses of the total 112, WG will start drafting report.

I35 – Disbanded following publication of C37.2-2022 in December 2022.

I29 – PC37.110 – Guide for Application of Current Transformers Used for Protective Relaying Purposes

Approved by RevCom. Being edited for publication.

Attend the presentation about this standard near the end of Main Committee meeting today.

I38 – document is published! IEEE Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources

- I49** – Report on Roadmap developing new or updating existing IEEE standards to address issues of Centralized Protection and Control (CPC) Systems
 PSRC I-SC is joint sponsor with PSCCC as lead.
 PSCCC P21 and PSRC I49 had a joint meeting.
 Work has started.
- I2** – Terminology Review
 Benton is liaison with PSCCC. They have a task force A8 formed who will train with WG I2 from the September meeting.
- I26** – Report on Mathematical Models of Current, Voltage, and Coupling Capacitive Voltage Transformers
 WG Ballot is completed. Will shortly send out for SC Ballot.
- I31, I36, I37, I40, I41** - C37.90.x and 1613
 1613, C37.90.2, C37.90.3 working through stages of recirculations.
 C37.90 is going to seek permission to go to SA Ballot in a couple of weeks.
 C37.90.1 almost ready for WG Ballot.
- I33** – Report on Review of Relay Testing Terms
 SC ballot was completed with 31 out of 39 I-SC members responding. Working group resolving comments.
- I48** – Review and revise C37.103-2015 – IEEE Guide for Differential and Polarizing Relay Circuit Testing.
 PAR was approved. Draft documents are being posted on iMeet and WG is starting reviewing and assignments.
- I44** – Report on skill sets required by relay test technicians for setting, commissioning, and testing relay systems, given new technologies such as IEC 61850
 Report is at final draft stage. WG Members to give final comments. Intent to submit for SC ballot prior to September meeting.
- I45** – Investigation of Grounding and Bonding Issues Associated with Substation Wiring Practices and Instrumentation
 Putting report in PES template format. Plan to go to SC Ballot end of this year.
- I43** – Report on Response to USA executive order regarding EMP protection
 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.
 Revisions to certain sections. Hope to complete after September meeting and go to SA ballot.
- I47** – Review and revise: IEEE C37.231-2006 - IEEE Recommended Practice for Microprocessor-Based Protection Equipment Firmware Control.
 PAR elevates recommended practice to a standard.
 PSRC continues as Lead Committee and PSCC plans to be now Joint Committee.
- MOTION TO REVISE PAR FOR C37.231: Change from Recommended Practice to Standard with changes to Title, Scope, Purpose, and Need as indicated in the following.**
 Motion made by Ritwik Chowdhury, Seconded by Roger Whitaker.
- Old Title:** IEEE Recommended Practice for Microprocessor-Based Protection Equipment Firmware Control.
- Proposed Title:** IEEE Standard Common Format for Documenting IED Firmware or Software Changes and confirming their transmittal (COMFIRM).
- Output:** IEEE Standard (change from Recommended Practice to Standard)
- Project Number:** PC37.231
- WG Assignment:** Revise IEEE Std C37.231-2006, IEEE Recommended Practice for Microprocessor-Based Protection Equipment Firmware Control
- Chair:** Don Burkart

Old Scope: The scope of this recommended practice is to identify the means for timely and efficient exchange of information between manufacturers and users of protection-related equipment with respect to (1) changes in device firmware and (2) the impact of those changes. It will also include an examination of the technical and operational ramifications resulting from changes in the device firmware. Only hardware changes that impact firmware changes will be included.

Proposed New Scope: This standard defines a common format and content for manufacturers of Intelligent Electronic Devices (IEDs) used in protection, automation, and control systems to document the changes in firmware or software to support users in their change management programs. The common format and content includes documenting each change with a classification and impact assessment on the performance, reliability (security and dependability), and functionality of an IED. Exchange requirements include the methods implemented by the manufacturers so that users can confirm the authenticity and integrity of the firmware or software itself along with the shared information.

Old Purpose: The purpose of this recommended practice is to facilitate the exchange of information between manufacturers and users of microprocessor-based protection equipment on the changes in the firmware and the impact those changes will have in the performance of the devices.

Propose New Purpose: This standard provides manufacturers of IEDs associated with protection, automation, and control systems with a common format and content for sharing information with users regarding changes in firmware or software. This standard provides users with the manufacturer's impact assessment on the performance and functionality of an IED to support their change management programs. This standard provides users with secure and reliable transmittal of the shared information and firmware or software.

Proposed Need: The state of the art has changed significantly since the original recommended practice was published in 2006. A standard reflecting modern methods is needed in light of the Solar Winds cyber security attack on a software manufacturer that penetrated thousands of organizations globally. Industry cyber security standards, either mandated by regulators or being voluntarily followed by users, include a change management program that necessitates a common format and content for information sharing so that users can confidently receive the shared information from manufacturers and then perform an effective evaluation of the shared information and firmware or software. With a common format and content specified in a standard, manufacturers can be confident they are sharing information in a way that meets the requirements of a broad set of users. With a secure and reliable method of transmittal specified, users can be confident in the integrity and authenticity of the updated firmware or software along with the information shared.

MOTION TO REVISE PAR FOR C37.231 AS INDICATED ABOVE CARRIED WITH NO OPPOSED and 1 ABSTENTION NOTED.

MOTION FOR JOINT COMMITTEE PAR

Motion: PSRC accept Joint Committee work of "Guide for Test Sets and Tools for Testing Protective Relays" in the role of Liaison.

Motion by Ritwik Chowdhury, Second by Chase Lockhart:

Title: Guide for Test Sets and Tools for Testing Protective Relays

Lead Committee: Corporate Advisory Group (CAG)

PSRC Role: Liaison

PSRC SC/ Group: SC I

SCOPE: This guide focuses on principles and methodologies of relay test equipment for the applications of type testing, functional acceptance testing, commissioning, and maintenance testing.

The guide covers guidelines on functionality performances of relay test equipment such as voltage/current output accuracy, output power, binary input time stamp, etc.

Details are given on the test methodologies, reporting of the test results, tools/libraries and automatic testing interface with protective relays to facilitate and improve the efficiency of the tests.

Finally, the guide covers the calibration procedures, configurations, and settings.

PURPOSE: The purpose of this guide is to provide technical guidance to users, test agencies and manufacturers in the design and application of protective relay test sets in order to assure that protective relay test sets meet power system protection testing requirements, for efficient and accurate tests.

The guide also provides guidance on the methods for the calibration of relay test sets, to support the users in the efficient calibration of their testing equipment.

The intention of this guide is to bridge the relay protection community and the relay test set community in order to minimize misunderstandings, improve the efficiency of the testing activities and help the users in selecting the correct test set for the given application.

NEED: Consistency between the performance declarations from different relay test set manufacturers: the proposing working group has noticed that there are no international standards available for relay test sets. Several misunderstandings exist in the relay protection testing community which create difficulties in the selection of the correct test set for the given application, in the validation of the same protective relay when using test sets of different type, and also in the comparison of the performances of different test sets.

Many utilities own a large number of relay test sets, and there is the need to periodically verify their calibration. A guidance on automatic calibration procedures would be of benefit for speeding-up and reducing the cost of these activities by increasing the efficiency of the maintenance of the test sets.

The protective relay standards (IEC 60255-1xx series) require a large number of tests to be performed by relay manufacturers. To increase the quality of the tests and also the time efficiency of the tests, there is need to have guidelines on automatic relay test procedures where the test sets are able to fetch the relay settings and adapt the test plans according to them.

The MOTION for PSRC to participate in the Joint Committee PAR in Non-lead role was discussed and vote was taken by show of hands. Having established quorum with 71 Voting Members present, a vote by show of hands indicated 36 in favor and 8 against; 17 indicated abstain; leaving 10 no-vote, also recorded as abstain. **Motion carried with 36 in favor and 8 against.**

Other topics:

Looking for Liaisons for:

Sensors SC of the Power System Instrumentation and Measurements (PSIM) Committee
Transformers Committee

Will Knappek has served as liaison to both of these committees and will be retiring end of this year. The I SC thanks him for his service.

I-SC voted to participate in Liaison role for Entity WG proposing 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.

J SC met Wednesday, May 10, 2023, with 23 members present – quorum was met

J6 Protection Issues Related to Pumped Storage Hydro Units – Report nearly complete, to SC ballot this summer**J15** Investigation of the Criteria for Motor Bus Transfer – Report complete, to SC ballot this summer**J18** Investigate the effects of sub-synchronous oscillations due to IBR on rotating machinery protection and control – No reliable commercially available EMTP model that can be used for SSCI studies; assignment could not be completed; after much discussion, working group disbanded**J25** Synchronous condenser protection (report) – concluded out-of-step protection is not needed); WG ballot Fall 2023**Four PAR activities:****J16** Revise C37.101 Generator ground protection: WG balloted; PAR closes 2024**J17** Revise C37.102 AC generator protection: Still working through 1st SA ballot comments closed 9/12/22; once comments resolved, draft 7.4 will be issued for WG review; then recirculation ballot**J19** C37.106-2022 published May 2023**J22** Revise C37.96 Motor protection: Work started, still need figures from earlier document; PAR closes 2025**“K” Subcommittee Report – Substation Protection****Chair:** Adi Mulawarman**Vice Chair:** Brandon Davies

Refer to K SC Minutes for complete report.

Met Wed May 10,- 2023. Quorum Met

Published guide (PAR)

Nothing to report since last meeting

Completed summary paper/ppt/report

Nothing to since last meeting.

Creation of 2 new task forces

Established WG’s continuing work: (6 WGs + 2 TFs)

K12/Sub I9 – Static Shunt Compensators

K25 – Shunt Capacitors

K26 – Shunt Reactors

K27 – Utility-Consumer Interconnections

K29 – Reducing outage durations

K31 – Breaker Failure

KTF32 – Investigate on need for clarification of ungrounded bus protection from bus protection guide

KTF33 – Investigate on the need for creating protection guide for filter banks.

VI. Presentation to the Main Committee:

Knapek made a presentation on IEEE C37.110 IEEE Guide for the Application of Current Transformers Used for Protective Relaying Purposes, to be published 2023. 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 DoubleTree Resort by Hilton Myrtle Beach Oceanfront, Myrtle Beach, SC, in September 2023.

X. Adjourn:

Motion to Adjourn was by crowd acclamation.
Meeting adjourned 10:45 AM PDT.

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 May 2023

See Tables below for

Completed PAR projects in 2023

Projects under consideration:

PAR Status

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

All PSRC Lead Committee PAR Projects (5/9/23):

Completed PAR projects in 2023:

Project	Title
C37.92	Standard for Analog Inputs to Protective Relays From Electronic Voltage and Current Transducers
C37.110	Guide for the Application of Current Transformers Used for Protective Relaying Purposes

Projects under consideration:

Project	Title	Status
PC37.231	IEEE Standard Common Format for Documenting IED Firmware or Software Changes and confirming their transmittal (COMFIRM)	PAR approved in Main Committee for RP to Standard. Expect PAR to be submittal in MyProject. WG I47
PC37.117	Guide for the Application of Protective Relays Used for Abnormal Frequency Load Shedding and Restoration	CTF51 Investigating bringing out of expired status.
PC37.246	Guide for Protection Systems of Transmission to Generation Interconnections	CTF52 Created May 2023
New	Guide for Filter Bank Protection	KTF33 Created May 2023

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	Craig Preuss	H41
PC37.1.3	Recommended Practice for Human Machine Interfaces (HMIs) 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: Comment Resolution	Kamal Garg	K26

PC37.233	Guide for Power System Protection Testing	31 Dec 2023	RevCom Agenda (15 MAY 2023)	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
PC37.251	Standard for Common Protection and Control Settings or Configuration Data Format (COMSET)	31 Dec 2023	SA Ballot	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
PC37.99	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
PC37.300	Guide for Centralized Protection and Control (CPC) Systems within a Substation	31 Dec 2024	SA Ballot: Invitation	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	Revcom Agenda (28JUN 2023)	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	Ellory Blood	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
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	32 Dec 2027	Draft Development	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_rewvg	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
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
P2004	PEL/SC/HIL	PEL/SC/HIL	Hardware-in-the-Loop (HIL) Simulation Based Testing of Electric Power Apparatus and Controls	Pre-Ballot
EPM P1952	EPM	EPM	Standard for Resilient Positioning, Navigation and Timing (PNT) End-User Equipment	Draft Development
EPM P0079R1	EPM	EPM	Guide for Test Sets and Tools for Testing Protective Relays	Initial

All PSRC Lead Committee PAR Projects (5/9/23):

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
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
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
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
C37.108	PE/PSRCC/C37.108_WG		Guide for the Protection of Secondary Network Systems	Completed

C37.110	PE/PSRCC/C37.110_WG-I15		Guide for the Application of Current Transformers Used for Protective Relaying Purposes	Completed
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
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		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	RevCom Agenda(15 May 2023)

C37.235	PE/PSRCC/C37.235_WG: I-30		Guide for the Application of Rogowski Coils Used for Protective Relaying Purposes	Completed
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

PC37.90.1	PE/PSRCC/C37.90.1_WG/I40	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-I36	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
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
P2030.12	PE/PSRCC/C38 Microgrid Protection Systems		Guide for the Design of Microgrid Protection Systems	SA Ballot: Comment Resolution

PC37.252	PE/PSRCC/C39_PC37.252		Guide for Testing Automatic Voltage Control Systems in Regional Power Grids	Draft Development
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/PC37.300		Guide for Centralized Protection and Control (CPC) Systems within a Substation	SA Ballot: Invitation
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/C37.90		Standard for Relays, Relay Systems, and Control Devices used for Protection and Control of Electric Power Apparatus – General Requirements and Tests	Draft Development
C37.92	PE/PSRCC/I-38		Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources	Completed
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
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/H40		Guide for Databases Used in Utility Automation Systems	Draft Development
PC37.103	PE/PSRCC/PC37.103_WG I48		Guide for Differential and Polarizing Relay Circuit Testing	Draft Development
PC37.109	PE/PSRCC/PC37.109		Guide for the Protection of Shunt Reactors	SA Ballot: Comment Resolution

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
PC37.239	PE/PSRCC/PC37.239_WG/H51		Standard for Common Format for Event Data Exchange (COMFEDE) for Power Systems	Draft Development
PC37.96	PE/PSRCC/PC37.96 WG J22		Guide for AC Motor Protection	Draft Development
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 Interconnections	Completed
PC37.249	PE/PSRCC/WG H22/PC37.249		Guide for Categorizing Security Needs for Protection, Automation, and Control Related Data Files	SA Ballot: Comment Resolution
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
2030.101	PE/PSRCC/WG_P2030.101_H38		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

PC37.251	PE/PSRCC/WG-H27_		Standard for Common Protection and Control Settings or Configuration Data Format (COMSET)	SA Ballot: Pre-Ballot
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
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 May 10, 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 May 10, 2023 at 1:15 PM Pacific Time. Members and guests in presence introduced themselves and indicated their affiliations. A quorum was achieved (28 out of 55 members and 49 guests).

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

The January 2023 minutes were reviewed. Sukumar Brahma made a motion to approve the minutes, Amin Zamani 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, May 19. 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 246. There were 13 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.
- The roll out of a new member management system (Member Planet) is in progress but behind schedule. It may not be ready for September meeting. Attendees were reminded to create a profile as soon as possible. More information is available at https://www.pes-psrc.org/member_planet. Before this new system is implemented, please be sure to follow required confidentiality practices. Ensure the BCC is used so that email addresses of members are not shared for general correspondence.
- P&P for Standards and P&P for Working Groups have been updated. O&P is under revision. There is a WebEx meeting expected before September to brief Man Committee members on O&P changes.

- 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 encouraged 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

Alex Apostolov reminded participants that the call of papers for the PAC World Americas Conference 2023 open. Consider submitting a paper.

The C44 WG's assignment was to "prepare a summary paper for IEEE Transactions on Power Delivery based on the contents of the report prepared by the C24 working group". The WG developed a summary paper and submitted to IEEE transactions on Power Delivery. The paper was not accepted. The paper was then submitted to the Open Access Journal of Power & Energy. However, the paper was not accepted there as well. During the C44 WG meeting, members decided to submit the summary paper for publication at the upcoming Texas A&M Conference for Protective Relay Engineers. To align, WG C44 assignment needs to be revised. Sukumar Brahma moved to revise the C44 assignment to "prepare a summary paper based on the contents of the report prepared by the C24 working group", Mani Venkata seconded, and the motion was approved with no opposition.

General Discussion

Manish Patel thanked SC members for taking time for reviewing and voting on the four following electronic ballots since the JTCM in January 2023:

- Working Group C25 summary paper based on published PES Technical Report on Protection of Wind Electric Plants.

- Working Group C46 summary paper from the work of C28, revision of IEEE C37.242, IEEE Guide for Synchronization, Calibration, Testing, and Installation of Phasor Measurement Units (PMUs) for Power System Protection and Control.
- Working Group C48 summary paper for C37.120 IEEE Guide for Protective System Redundancy for Power System Reliability.
- Working Group C39 Entity PC37.252 Guide for Testing Automatic Voltage Control Systems in Regional Power Grids.

Adjourned

The subcommittee meeting adjourned at 2:35 PM Pacific Time.

Working Group Minutes

C23: Coordination of Synchrophasor Related Activities

Chair: Yi Hu

Vice Chair: Gustavo Brunello

Secretary: N/A

Output: N/A

PAR and PAR expiration: N/A

Established Date: 16 Oct 2015

Expected Completion Date: N/A

Draft: N/A (published)

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

Meeting Date and Time: Hybrid meeting, On May 8, 2023 at 5:00 pm PDT

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

- Informed attendees regarding the recent organizational changes in NASPI task teams – The Performance, Standard, Requirements, and Verification Task Team (PSRVTT) has been sunset
- Reviewed and updated the assignment of WG C23 in light of the NASPI changes
- Current NASPI activities as reported at the 2023 April NASPI work group meeting were reviewed, discussed, and updated
- IEEE PSRC ongoing synchronized measurement related activities were reviewed, discussed and updated
- IEEE PSCCC ongoing synchronized measurement related activities were reviewed, discussed and updated
- NASPI past work and publications were discussed and updated
- NASPI September 2023 work group meeting date and location were announced
- PSRC/PSCCC September 2023 meeting date and location were announced
- Old Business:
 - None: no new work items to be carried from NASPI to IEEE or vice versa
- New Business:
 - None

Adjourn at 6:00 PDT

Upcoming PSRC/PSCCC and NASPI Meetings:

Next C23 meeting will be during PSRC/PSCCC meetings September 18 – 21, 2023, Myrtle Beach, SC

Next NASPI Work Group Meeting, September 26-27, 2023, Charlotte, NC

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

Chair: Amin Zamani

Vice Chair: TBD

Output: Summary Paper

Established Date: May 2021

Expected Completion Date: December 2022

Draft: 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 on Tuesday – May 9, 2023 at 09:10–10:30AM PST. There were total of 19 attendees in the meeting, 4 members and 15 guests.

Meeting Agenda

- Introductions
- Discuss status of the paper
- Review recent comments received from PSRC officers
- Discussion of the next step
- Adjourn

Summary of Meeting Discussion

- a) The meeting started with the introduction of all attendees.
- b) The chair provided an update on the latest status of the summary paper. It was announced that the paper has been accepted for presentation in WPRC. The paper will also be submitted to a couple more conferences.
- c) The WG went through the latest comments received from PSRC officers and addressed all of them.
- d) It was decided to keep the next meeting in September to finalize the presentation for WPRC.
- e) The meeting was adjourned at 10:20 AM PST.

For next meeting, we request a room for 25 people with a projector. Please avoid conflicts with C45, D43, C50, and C38.

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: May 2023

Draft: 6.0

Assignment: Revise PC37.233-2008 Power System Protection Testing Guide

The in-person meeting for working group C26 was cancelled for the May PSRC meeting in Las Vegas. The guide (PC37.233) is on the RevCom agenda for 5/15/23. Based on the MyProject information from the IEEE-SA website regarding the Guide, it appears that we have 10 preliminary approval votes, with no negative votes, abstentions, or recusals.

It is the opinion of the Working Group leadership that this project will not be a good fit for either a presentation to the Main Committee, nor a summary paper.

Contingent on publication of the guide prior to the September meeting, we will need a single session in which our only order of business will be to disband the working group.

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

Chair: Kevin W. Jones

Vice Chair: Mike Kockott

Secretary: N/A

Output: Tutorial

Established Date: May 2016

Expected Completion Date: May 2024

Draft: 1.10

Assignment: Create a tutorial on test instructions/parameters to accompany the PSRC documents Application of Out-Of-Step Protection Schemes for Generators, and Tutorial for Setting Impedance Based Power Swing Relaying on Transmission Lines, to aid the users in

quality testing of their settings and systems when following the working group outputs which recommend testing of complex relay settings and systems.

Working Group C29 met with 16 attendees on Tuesday, May 09, 2023, 9:20-10:30 AM PDT. There were 3 confirmed members, 11 confirmed guests, with 2 unable to remember their status.

Kevin was unable to attend, so Mike ran the meeting on his behalf with Gene taking notes.

After introductions the January 2023 minutes were reviewed. With no objections these minutes were approved.

Next the status of draft version 1.10 of the tutorial was reviewed.

Assignments:

Review comments and clean up the Introduction: Abel Gonzalez

Complete Section 2 review and clean up and Section 3 review and clean up: Mohit Sharma plus assigned team (Mohit to lead)

Target for the above: end August 2023

The proposed survey was then discussed. A wide-ranging discussion followed. The consensus was that the survey questions need refining to yield meaningful information to give direction to both C29 and D29 tutorials. Members from both C29 and D29 will meet within the next two to three weeks to finalize the survey questionnaire. The plan is that the survey will be sent out, and the replies received, before the September meeting. The method to follow to distribute the survey will be discussed at the C sub-committee meeting.

With there being no further business Mike 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: D4

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

In Person, Las Vegas NV, May 10 2023, 09:20 – 10:30 PST.

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

Dean started the meeting with 8 attendees, 4 members, and 4 guests in attendance.

The chair discussed the resolution of all open writing assignments from the previous meeting. The C33 contributions have been added to the P2004 document and contributing members have been identified. The P2004 working group has added PSRC as a co-committee and C33 members will be able to participate in the balloting.

The following people were present:

Mike Basler (G)
Amin Aamani Quanta (M)
Fred Agyekum SEL (G)
Antony Johnson SCE (M)
Paul Harris Pacificorp (G)
Ratna Konouku WSP (G)
Aaron Findley POWER (M)
Dean Ouellette RTDS (M)

Action Items:

C33 members to review and comment on the final P2004 document when it goes to ballot.

Outstanding writing assignments:

New Business:

Meeting was adjourned at 10:05 am PST.

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

Established Date: May 2018

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.

May 9, 2023 Meeting Minutes Hybrid Meeting

Officer Presiding: S. S. (Mani) Venkata

Minutes Prepared By: Mat Garver & Michael Higginson

This meeting was in-person only in Las Vegas, NV. It was chaired by Chair S. S. (Mani) Venkata.

The meeting commenced at 9:20 AM. There were 34 attendees, with 6 voting members, 2 non-voting members, and 26 non-members. Quorum was not met.

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

The working group began with introductory remarks by the Chair.

Topics discussed included:

- Mani gave an overview of WG C38 and explained C38 was responsible for producing a guide for 2030.12.
 - o He explained that the PAR expires in 2024.
 - o He expressed that the WG would like to go to ballot by end of 2023.
- At the last meeting a resolution committee was formed, and they have been working through the comments.
 - o The majority of the resolution committee was not present.
 - o Don Ware reported on the testing portion. Areas of the guide where 61850 testing was covered, the guide referenced the 61850-testing guide instead of duplicating work by copying text into the C38 guide.
 - o Comment from Mike Bloder that there are only 2 comments remaining for subclause 5. Neither of the 2 comments are mandatory for resolution. The team will discuss with Sebastian Billaut and resolve. Sebastian commented that they are pretty much complete with this task for subclause 5.

C38's next meeting will be in September of 2023 at Myrtle Beach, SC. The WG intends to continue to work on comment resolution and go to ballot recirculation by the end of the year.

The meeting was adjourned at 10:30 AM.

C39: IEEE PC 37.252 Guide for Testing Auto Voltage Control Systems in Regional Power Grids

Chair: Xiaopeng Li

Vice Chair: None

Secretary: Kai Liao

Output: Guide

Established Date: February 2019

Expected Completion Date: December 2022

Draft: 5.0.

Working group C39 did not meet at this meeting.

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

Chair: Vasudev Gharpure

Vice Chair: Mital Kanabar

Secretary: Mital Kanabar

Output: Tutorial planned (Paper, Presentation in future)

Established Date: January 2020

Expected Completion Date: December 2022

Draft: 1.01

Meeting date: 5/9/2023

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

9 Attendees (2 members, 7 guests): The meeting attendee snapshot is included below.

- IEEE copyright slides were shared.
- Introductions
- Status update: A tutorial had been approved for the general meeting 2021. However, it had to be withdrawn as it needed an in-person session, and our travel was not approved.
- We expect to continue to work on the tutorial and seek further avenues for it.

No	Name	Affiliation	Member/Guest
1	Vasudev Gharpure	Quanta Technology	C
2	Mital Kanabar	GE	VC
3	Ken Martin	EPG	G
4	Christoph Lochner	GPA	G
5	J. Ritchie Carroll	GPA	G
6	Tom Thompson	IEEE SA	G
7	Craig Palmer	PowerComm	G
8	Peiman Dadkhah	Nugrid Power	G
9	Shashidhar Reddy Sathu	SEL	G

C41: Investigate performance requirements for Distribution PMUs

Chair: K. Martin

Vice Chair: N. Perera

Secretary: D. Gurusinghe

Output: Report

Established Date: January 2021

Expected Completion Date: May 2024

Draft: 0.5

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

Working Group C41 met on Tuesday, May 9, 2023 at 3:40pm (PDT) with 9 participants at the PSRC meeting. Ken Martin (Chair) welcomed participants and briefed the objective of the WG, which is described in the assignment above.

As the participants were new to this WG, Ken provided an overview of what the WG objective is, how the group evolved, and the status of the WG. The analysis of distribution system data is now complete and Ken is leading the editing to add that information to the report. The analysis did not reveal an exceptional amount of noise or harmonics but did show some signal excursions faster or larger than the previous standards have anticipated.

Ken reviewed the WG report draft including the new additions of the analyses that are not complete. Most of the results from analyses fit within the limits of the current standard. Exceptions include the rate of change of voltage or current in the ramp test. This could be accommodated with a higher ramp rate or an additional class in addition to P and M class. As there is some interest in including measurement at very high levels including a fault level, it could make sense to have varying levels of certification rather than just a few classes. This and the impacts on windowing on classes and performance were discussed. No particular conclusions were reached. Ken also reviewed the section on applications for measurements in the distribution area. It was noted that in this as well as the presentation by Romano that we are still using TVE as the measurement evaluation. There are cases where switching to separate magnitude and phase would be better, but as yet there is no great drive to do so. It was noted that a 1% TVE accuracy still seems to be sufficient for at least most applications. It was also noted that it is difficult to achieve accuracy much higher than on a production basis, though higher resolution and repeatability may be achievable and are maybe what is more needed.

Ken will complete and post the latest revision of the WG report. The WG will continue with monthly meetings and continue editing and revising the report with the new additions at the next meeting. The next meeting is anticipated for late May or early June.

Recorded by Ken Martin

#	Attendee	M/G
1.	Ken Martin	M
2.	Vasudev Gharpure	G
3.	Mital Kanabar	G
4.	Ritchie Carroll	G
5.	Randy Hamilton	G
6.	Lakshan Piyasinghe	G
7.	Yoav Sharon	G
8.	Peiman Dadkhah	G
9.	Shashidhar Reddy	G

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

Chair: Yi Hu
Vice Chair: Adi Mulawarman
Secretary: Zheyuan Cheng
Output: Report
Established: January 2021
Completion: December 2023
Draft: V116

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

Working Group C-43 met in a single-session in-person on May 10, 2023 with 40 attendees (6 voting members). Yi Hu and Adi Mulawarman presided the meeting in-person. A round-the-table introduction of all attendees was taken. Yi reviewed the WG C43 assignment at the start of the session.

Yi reported the status of the report: Most of the C subcommittee review comments have been addressed. A comment resolution table have been created to ensure all comments have been properly addressed. Both redlined and clean copy of the report along with the comment resolution table will be submitted to C subcommittee chairs for a final review. The clean version report will obtain the final approval from PSRC officers before submitting it to IEEE for publication.

Murty reminded and cautioned the WG: if we want to submit it as IEEE transaction paper then we should not publish it in PES Resource Center yet. If it is only for a conference paper, then it is okay to publish.

Someone also brought up a discussion on new technology that is already out recently such as ChatGP, etc. Are there applications on these newer techs for AI/ML applications for control and protection?

Sukumar Brahma mentioned the limit of 5 pages for conference papers at T&D, ISGT and General Meetings. Potentially can use this report as a tutorial based on future GM. The tutorial can be worked on parallel via a different WG as the report WG. Tutorial request/submission can be done directly to the portal. We can work with Gene H. to submit if interested.

Juan Pineros mentioned it is very important to understand the risk and how to adapt the AI/ML program. Motion to adjourn by Alex Apostolov and seconded by Vahid Madani. Regarding next steps of the WG C43, the WG chairs plan to organize several web meetings to discuss among WG members.

Meeting adjourned at 11:20 AM PDT.

Next meeting: Single session to be held in conjunction with PSRC/PSCC September 2023 meeting. A room for 40 people. HD projector with HDMI connector.

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

C44: Prepare a Summary Paper for IEEE Transactions on Power Delivery Based on the Contents of the Report Prepared by the C24 WG “Modification of Commercial Fault Calculation Programs for Wind Turbine Generators”

Chair: Sukumar Brahma (Clemson University)

Vice Chair: Evangelos Farantatos (EPRI)

Secretary: N/A

Output: N/A

Established Date: September 2021

Expected Completion Date: May 2024

Draft: 10.0

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

C44 met at 9:20am PT on Wednesday 05/10/2023 with 14 attendees - 8 members and 6 guests.

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

It was reminded to the attendees that the original submission of the paper to IEEE Transactions on Power Delivery (TPWDR) in 2022 was rejected due to non-originality because of the publication of the TR-78 “Modification of Commercial Fault Calculation Programs for Wind Turbine Generators” by C24 WG. Despite the efforts of Murty Yalla (PSRC committee chair in 2022) who contacted the Editor in Chief of TPWRD and PES VP of publications to explain the innovation and originality of the paper, the decision did not change.

Then, in February 2023, upon suggestion from Sukumar and agreement from the C44 members, the paper was submitted to the IEEE Open Access Journal of Power and Energy (OAJPE). On May 9, an email with the decision of paper rejection was received. The reviewers’ comments were discussed during the C44 meeting.

Then the attendees brainstormed alternative options for submission of the paper to other journals or conferences. The consensus was to target a conference that would result in publication of the paper at the IEEE Xplore. It was decided to submit the paper to the 2024 Texas A&M Annual Conference for Protective Relay Engineers.

Finally, the C44 members voted to change the title and assignment of the WG, in particular remove the text “for IEEE Transactions on Power Delivery”.

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

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

Chair: Ali Hooshyar

Vice Chair: Manish Patel

Secretary: Ritwik Chowdhury

Output: Report

Draft: 1.1

Established Date: May 2021

Expected Completion Date: 2024

Assignment: To prepare a technical report to investigate short-circuit modeling and protection of systems with high penetration of IBRs as a continuation of the works of WGs C32 and C24. The attendees introduced themselves. There were 20 members and 33 guests in attendance. Quorum was not met. Past meeting minutes will be approved via an electronic vote.

Sherman Chen from ASPEN presented an effort on IBR short circuit modeling in commercial short circuit programs. Sherman is working with Siemens Gamesa (WTG OEM) to show a proof-of-concept that converter interfaced resources including Type III WTGs could be modeled in commercial short circuit programs using the dynamic-linked library (DLL) files. Such a method resolves challenges in modeling IBRs with a table format presented in the Technical Report 78 (TR-78) developed by the C24 WG. This also helps with improving accuracy compared to using generic models. The presentation was well received. A few points of interest are noted below:

1. Can transients be represented by the DLL based model? The answer is likely 'no'. The intent is to model the controlled response.
2. Who would validate the short circuit response using DLL based model? The WTG/Inverter manufacturer is responsible for providing a DLL model that is a good representation of the actual equipment. The manufacturer is also expected to validate these models by comparing response to one observed with EMT simulations. The model validation is already covered in TR-78. Aboutaleb Haddadi offered to help with model validation content, if necessary.
3. Will there be any impact on programs computation efficiency? No impact is anticipated at this time.

Sherman's presentation is available here: <https://psrc.sharefile.com/d-s88adb3d5e9e545a58d0658ed8c682956>.

Ritwik Chowdhury then reviewed draft content Section 5 (Transmission Line Protection) and Section 6 (Protection of Other Components).

1. Jason Eruneo asked if any utility is using series-compensated lines near IBRs. It was noted that series-compensated lines near IBRs are present in PNM, possibly BC Hydro, and transmission network in panhandle region of Texas. Ritwik asked for volunteers for section covering series compensated lines. No volunteers came forward at this time and the default assignment went to Ritwik.
2. Amin Zamani asked if the C45 report includes plant equipment protection? Yes, the existing draft includes some content regarding protection of equipment within the plant. However, it was recognized any related discussion should be brief and details are in scope of the technical report under development by the C50 WG.
3. Following review assignments were made, all of them are due by **June 30, 2023**, to Ritwik Chowdhury (ritwchow@ieee.org). Please track changes to the draft available in the following link when submitting the assignment: <https://psrc.sharefile.com/d-s1abd3a47113343cd89715ac2a1724f94>.

- a. Section 5.5: **Genariel Hernandez and Mike Jensen**

- b. Section 5.7.1: **Mike Jensen**
 - c. Section 5.8.3: **Ritwik Chowdhury**
 - d. Section 6.1.1 (V/Hz and Through Fault Protection only): **Jason Eruneo**
 - e. Section 6.1.2 and 6.2.7: **Amin Zamani**
 - f. Section 6.1.3: **Amin Zamani and Doug Taylor**
 - g. Sections 6.1.4 and 6.2.4: **Adi Mulawarman**
 - h. Section 6.2.3: **Amin Zamani, Jason Eruneo, and Chase Lockhart**
 - i. Section 6.2.5 (REF section only): **Sebastian Billaut and Jason Eruneo**
 - j. Section 5.7.2: **Aboutaleb Haddadi, Manish Patel, and Ritwik Chowdhury** will coordinate an appropriate split between this subsection and Section 3 when the content is ready.
4. Mike Jensen asked how IBRs would change anything related to mutual coupling, tapped lines, etc. It was noted that negative sequence polarization could be difficult to apply and hence use of zero sequence polarization is recommended in systems dominated by IBRs. The effect of mutual coupling then becomes important. The line protection guide could be a good resource. The report should only include a brief summary with reference to existing literature. **Ryan McDaniel** will contribute a section to it and **Mike Jensen** volunteered to review this section when it is ready.
 5. It was also noted that there is no need to include discussion on load encroachment in this report. This section has been removed.
 6. Also clarified temporary versus transient overvoltage. The temporary overvoltage is fundamental frequency overvoltage that may occur on unfaulted phases. The transient overvoltage is a sub-cycle overvoltage.

Mohammad Zadeh offered to review the short circuit modeling section and provide some content showing how iterative process could be improved in commercial short circuit programs to aid with convergence (i.e., avoid numerical instability).

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: 4.1

Assignment: Drafting of a summary paper of C37.242

Meeting Date and Time: Hybrid-Meeting, On Sept 13, 2022 at 09:20am CDT

Attendance: 8 members, 3 guests

Call to order

Officer presiding: Allen Goldstein

Officer recording minutes: Allen Goldstein

Summary of Activities and Discussions

C subcommittee had provided 98 comments on the paper. The chair had categorized this as "Editorial", "General", "Technical" groups. 65 comments were resolved in the meeting.

Next meeting: 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 2025

Draft: 1.0

Assignment:

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

CTF47 met on Tuesday May 9, 2023, at 13:00 PDT with 18 attendees in person.

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

First, the scope of the taskforce was reviewed. Then, the status of the PSDP taskforce report was presented. It was announced that a draft of the report is planned to be shared with the CTF47 members before the next meeting in September. Attendees were also informed about two upcoming panel sessions in IEEE PES GM 2023, one sponsored by PSRC committee and the other by PSDP committee. Finally, Sandro Aquiles-Perez from Siemens Industry Inc. presented on "Protection Modeling and Simulation in the Transient Stability Environment".

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

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

C48: Summary/conference paper development for C37.120 IEEE Guide for Protection System Redundancy for Power System Reliability

Chair: Alla Deronja

Vice Chair/Secretary: Melvin Moncey Joseph

Output: Conference paper

Established Date: May 2022

Expected Completion September 2023

Draft: 5

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

WG C48 met on Tuesday, May 9, 2023, in a single session with 7 members and 8 guests attending.

The January 10 WG meeting minutes at JTCM 2023 were approved. Motion: Don Ware, 2nd: Manish Patel.

Draft 3 of the document was sent to the Subcommittee C for review and approval in February of 2023. The document was approved with no negative votes but many comments. Most of the received comments were incorporated, and Draft 4 was created.

At the meeting, the WG resolved a few technical comments received after the compilation of Draft 4 following the Subcommittee C vote.

The paper will be submitted to the PSRC Main Committee officers for approval. The intent is to have the paper reviewed by the PSRC officers before the PSRC September 2023 meeting, at which the WG would work on the comment resolution.

In parallel, we started working on the presentation for the conferences and submitted the paper abstract to the 2023 WPRC and MIPSYCON. WPRC declined the paper, and the response from MIPSYCON has not yet been received.

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

Please avoid conflicts with D42, D47, D37, K31, CTF52, and I2.

C50: Protection of Inverter-Based Resources

Chair: Brandon Davies

Vice Chair: Amin Zamani

Output: Report

Established Date: September 2022

Expected Completion Date: January 2025

Draft: 0

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

The WG met (in person) on Tuesday – May 9, 2023 at 05:00–06:10PM PST. There was a total of 21 attendees in the meeting (11 member and 10 guest).

Meeting Agenda

- Introductions
- Status update
- Continue discussions on proposed additions/changes
- New assignments
- General discussion
- Adjourn

Summary of Meeting Discussion

- a) The meeting started with the introduction of attendees. The chair briefly discussed the assignment and the goal of the WG. It was explained that the plan is to expand the current TR and cover other types of IBRs.

- b) It was discussed that TOV scenarios within the plant may be discussed in the new version, if not already covered.
- c) Jason E. recommended to use the same language as IEEE Std. 2800 in the new TR.
- d) The Chair went through the sections of the document to identify volunteers for revising each section.
- e) Manish suggested adding a substation configuration with two parallel GSU transformers (large solar systems), if not there.
- f) It was suggested to include Type 1 and 2 of the WTG in the TR but put a disclaimer that They are not IBR.
- g) Adding Grid Forming (GFM) as a topic to the report was discussed. Given the current state of this technology, the group felt it was important to identify GFM as a possibility, but not put too much focus on the details as part of the revised report.
- h) The group discussed adding one subsection talking about fault current behavior of IBRs with reference to C45.
- i) The group discussed adding more discussion to the voltage and frequency coordination section and considerations for setting these elements related to the equipment capabilities rather than directly at the PRC-024 performance requirements. Jason E. offered to revise the applicable section to provide more discussion on this topic.
- j) Chair/V-Chair will share assignment list with the attendees so that everyone can select a section to support. Vice Chair will also share the original editable report.
- k) The meeting was adjourned at 6:10 PM EST.

For next meeting, we request a room for 30 people with a projector. Please avoid conflicts with C45, D43, C25, K31, and D45.

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

Chair: Kevin W. Jones

Vice Chair: TBD

Secretary: N/A

Output: Guide

Established Date: January 2023

Expected Completion Date: TBD

Draft: TBD

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

CTF51 did not meet at this meeting.

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

Chair: Melvin Moncey Joseph

Output: Recommendation to Subcommittee on Guide Revision

Draft: TBD

Established Date: May 2023

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

- CTF52 met for the first time on May 9th, 2023, at 8:00 am PDT
- Introductions from everyone present in the room. 20 individuals attended the meeting.
- Guide was previously published in 2017. Current guide expires in 2027.
- Chair reviewed the IEEE SA meeting guidelines slide
- Attendee asked why is there a 10MVA minimum limit in the scope/purpose? It was clarified that 1547 previously provided the 10MVA value which was removed in the 2018 revision of 1547.
- Discussion on whether to define a transmission and sub transmission voltage numbers in the scope/purpose. The voltage value was not incorporated as different utilities have different voltage levels for transmission, sub transmission and distribution voltage level.
- Discussion on whether to include the aggregate effect of DERs in protection of distribution transformers and the transmission lines associated with it.
- Recommendation was made to include the definition of DERs in the guide while not removing it from the scope/purpose and to add a section on the aggregate effect of DERs in the revised guide.
- Chair displayed the slides on new ideas to be looked in to during the revision of the guide. Suggestion was put forward to incorporate IBRs impact on protection from C32 and C45.
- Chair and Manish Patel will speak to Malia (IEEE SA) to see if this guide can be shared with everyone who attended the Task Force meeting.
- It was decided to have another Task Force meeting to iron out any changes that need to be made to the scope/purpose once the members get to read the original document.
- Chair adjourned the meeting at 9:10am.

For the next meeting, we request a room for 40 people, single session, with a computer projector. Please avoid conflicts with C48, D37, D42, C50, D47, J17, D38, ITF49 and K31

CTF53: Task Force to Study Need for an AI/ML Data Collection Working Group

Chair: Dan Sabin

Vice Chair: TBD

Secretary: TBD

Established Date: May 2023

Output: Recommendation to Develop a Technical Report

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

Call to Order: The first meeting of a Task Force to Study Need for an AI/ML Data Collection Working Group meeting convened at 10:41 AM with 13 attendees. Meeting minutes were recorded by Dan Sabin.

Project Study

At this meeting, the task force focused its discussion to answer these questions:

- Is there sufficient interest and are there resources that exist to develop a new IEEE PES report?
- What is the relationship of the proposed report to other reports or standards and what is its distinct identity be from them?
- Does the proposed report project have viable volunteer leadership and participation?
- Does the proposed report have realistic scope and objectives?
- Does the proposed report offer the opportunity to establish new areas of expertise within the PSRC?

Initial consensus of the participants was that the answers to these questions were “yes”, but we will need to work on a proposed outline to dive deeper into the proposed report.

Meeting Discussion:

Here are some of the topics that were discussed during the meeting:

- Could the proposed working group review AI/ML use cases, especially the use cases described in the C43 draft report, and summarize data sets for each and which parts of the data sets are common?
- Should the working group focus on just the use cases in the C43 working group report, or should it consider new use cases as well?
- Could the proposed working group develop requirements for AI/ML data sets and gather small examples?
- Could the IEEE Std C37.239, Common Format for Event Data Exchange (COMFEDE) that could be reviewed for this report?
- What are the data sources for AI/ML projects: For example, event reports, real-time data, waveforms, and device settings.
- Should we identify the existing data sources and the type of data they produce?
- Are there new technologies that have become available in the past six months that could be leveraged?
- Should we review existing databases or data lakes for central event collection?
- We may have a challenge to overcome in getting example datasets from data owners.
- Should the working group describe a “profile” on how to use ML data?
- Should we focus on use cases where existing protection & control applications are not working as well (e.g., areas with high concentration of DER)?

- Many academic papers focus on training neural networks using simulated data; this report could focus on the importance of using real data for training ML models.
- One case study to consider is an inrush detection algorithm that focuses on waveform only; the status of the nearby breaker should be available that tells you that a breaker just closed, but may not be leveraged with the waveform.
- What are proactive things can that be done to prevent failure?

Next Meeting: The next meeting of the CTF53 Task Force should be a web meeting in August. A doodle poll will be sent in July to identify the meeting date and time.

The CTF53 Task Force will meet also in person at the IEEE PES PSRC committee meetings on September 18-21 in Myrtle Beach. See <https://www.pes-psrc.org/meetings.html> for more information.

Adjournment: The meeting adjourned at 11:50 AM.

Attendees:

First Name	Last Name	Affiliation
Alex	Apostolov	OMICRON Electronics
Swagata	Das	Schweitzer Engineering Labs
Yanfeng	Gong	Schweitzer Engineering Labs
Aboutaleb	Haddadi	EPRI
Shane	Haveron	AMETEK Power Instruments
Yi	Hu	Quanta Technology
Mark	McChesney	Oncor
Dan	Sabin	Schneider Electric

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 (Las Vegas, NV) on Wednesday, May 10, 2023, from 4:15 to 5:30 PM PST.
- Officer presiding – Meyer Kao
- Officer recording minutes – Alla Deronja
- The Subcommittee meeting was called to order by the Chair
- Introductions were made by the attendees
- The meeting was attended by 30 voting members and 30 guests. Quorum was met (30 out of 44).
- Minutes from the January 2023 meeting held in person and virtually were approved - motion made by Jonathan Sykes and seconded by Greg Ryan.
- Agenda for the D Subcommittee May 2023 meeting was approved - motion made by Chris Walker and seconded by Steve Conrad.

The Chair reviewed items of interest from the Advisory Committee.

- WG Chairs: please send up to date minutes to Chair and VC by May 19, 2023
- Reminders:
 - Please use the template
 - WG officers to update meeting attendance and keep records of newcomers who are not in the system
 - Please use the template for Technical Reports (including Tutorials)
 - WG Officers, D-subcommittee members, and guests, please setup your profile for MemberPlanet. Regardless of committee participations, an individual will only have a single profile under PES. Right before the PSRC meeting, PES estimates that they are at about 40% response rate (though no statistics on just PSRC). Mike Thompson emphasized the need to create individual profiles as soon as possible since MemberPlanet to go live on June 5. There is a link on the PSRC Membership page, and the email to create profiles was sent by Jim Niemira, the PSRC Secretary
 - WG Officers and D-subcommittee members, please keep in mind that balloting on WG Reports, Transactions Reports, Surveys, Summary Papers requires at least 75% of the Subcommittee members to Approve. Duties of SC members include timely responses to assignments and ballots, as listed under PSRC O&P Subclause 4.4.4
- Advisory Committee items of interest:
 - Attendance: 246 registered for the PSRC meetings, 13 attended Newcomer's Orientation
 - Future Meetings
 - September 2023 – Myrtle Beach, SC
 - January 2024-New Orleans, LA
 - May 2024 – Buffalo, NY
 - September 2024 – Indianapolis, IN (tentative)
 - Thursday morning continental breakfast at 7 AM
 - If you have a car and parked at the hotel, parking is included with the room; check your hotel bill

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

Working groups gave reports on their activity.

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

Chair: Kevin W. Jones

Vice Chair: Normann Fischer

Secretary: N/A

Output: Tutorial

Established Date: May, 2014

Expected Completion Date: May, 2024

Draft: 1.10

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

Attendees: 24 in person attendees (6 members, 2 non-voting members and 16 guests)

- 1.) The meeting discussed the survey sent out by Ratan Das regarding the application of power swing blocking and out of step tripping as applied within the power industry.
 - The survey created a tremendous amount of discussion within the working group.
 - The outcome of the discussion was that a survey regarding the application within the industry of power swing blocking and out of step tripping was important but that the survey in its present form did not provide much insight into present utility application and practices.
 - D29 and C29 will collaborate in this effort.
 - A subgroup within D29 and C29 would meet and craft a new survey that would provide greater insight into these practices. This insight would be used to strength the reports generated withing D29 and C29.
 - Once the survey has been crafted it will be sent out to utilities interested in participating.
 - Both Mike Kockott (Vice Chair of C29) and Normann Fischer (Vice Chair D29) will make their email addresses available to members who wish to participate in crafting the survey question.
 - The email address for Normann Fischer is a s follows: Normann_Fischer@selinc.com.

- 2.) 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 2023****Draft 9.0****Working Group Assignment: Write a tutorial on factors affecting the application and setting of ground mho and quadrilateral distance elements on transmission lines**

Working Group D30 met in person in Las Vegas NV and online at 5:00 PM PDT on May 10, 2023 with a total of 22 attendees, including 8 members and 14 guests.

The technical report went to a ballot of the Subcommittee on March 9, 2023. In order for the report to be approved, 33 approval votes are required. As of Monday, May 8, 2023, we had received 31 responses, 27 approved, 4 disapprove. Some responses have been received over the past few days.

We discussed changes to Section 1, the introduction, and certain other sections to clarify the purpose and scope of the Tutorial. For example, add a description to highlight Section 7 which provides settings and application guidance and Sections 2 through 6 which provide more details and informative depth to the tutorial. There was also some discussion on possibly eliminating or reducing certain sections, as received in the balloting process.

In order to expedite the responding to all of the comments, the WG decided to meet for an hour about every 2 weeks via Teams or Webex. TWG members, and reviewers will be invited to the online meetings. The WG Chair will issue a Teams invite for the first two meetings, May 19 and June 2 in the next few days

Meeting was adjourned.

Propose a single session for 30 attendees for September 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: 8 in person (See Attendee list)

- 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).

- No feedback was received from any of the members wrt to the IEC document IEC 60255-187-3 06122022 (latest draft)
- As was discussed in I4, IEC 60255-187-3 is going to be cancelled due to it being more than 5 years late, however the proposal to the IEC is to restart this activity immediately after it has been cancelled.
 - For the restart activity both the scope and outline will be revised, the new activity is probably going to begin in September of 2023.
- The chair invited all those interested in this activity to review the present document and send comments wrt the content and possible topics to include in the document to him for discussion at the next meeting in September.
 - Anyone interested in obtaining a copy of the present draft should contact the chair at the following email address Normann.Fischer@selinc.com

For the 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

Meeting was cancelled due to report submission for D-Subcommittee review.

No requirements for future meetings.

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

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 May 9th 3:40pm PDT with 12 people in attendance.

Chair mentioned that all review assignments and Section 3.1 writing assignment has been received.

Chair also informed the group that some definitions need to be removed since they are not used in report.

Paper by Bogdan will be incorporated to report for current inversion.

Updated plan to clean up and complete the report was discussed.

Section 1, 2 – Final clean up by Melvin

Section 3, 5 – Final clean up by Mike

Section 4 – Final clean up by Joerg

Section 6 – Final clean up by Aaron first and then Norman (Possibly add new content where required for bypass failure)

For the next meeting, we request a room for 25 people, single session, with a computer projector. Please avoid conflicts with C29, C41, C48, CTF52, D29, D42, D47, J18, I49 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: 1.0

Assignment: Prepare a technical report to the line protection subcommittee to evaluate the impact of high SIR on line protection.

Presiding Officer:

Minutes Recorded by:

Agenda:

1. Introductions/Sign up sheet/roster
2. Review Working Group Membership and Membership Process
3. Approve previous meeting minutes: first - Jeff Barsch second - Sabastian Billaut
4. Discuss status and progress of report
5. Review writing assignments
6. Discussion of next steps
7. Adjourn

Minutes: Attendance – 29 total – 21 Members and 8 Guests

- Chris opened and in room introductions started at 8am
- Chris showed the membership of the working group and advised everyone to review and contact either Chris or Greg if they would like to be a member or believe they should already be a member so we can update the roster.

- Chris reviewed some recent changes and then requested teams to be formed to review the report. We have a goal to finish and publish prior to balloting of the transmission line guide.
- The working group discussed the section on mutual coupling. It has not been written yet. It is proposed to move mutual coupling into a more expansive section to include many other issues that can affect SIR but are insignificant or nearly insignificant. Those items will be grouped together and moved. Ritwik Chowdry volunteered to write a paragraph.
- Ritwik will write-up Section 5.2 Steady State error. Sebastian Billaut will review Ritwik's write-up on steady state error.
- Chris Walker will start a writeup for our conclusion.
- Ted Warren will review the IOC section.
- Appendix section will be an applications example to illustrate the use of the report. Ritwik will writeup Appendix
- A PSRC file share may be created to share the latest revision of the report. The latest revision will also be shared via email
- A section on Ultra High Speed elements was written by Ryan McDaniel and will be included in the latest draft.

Volunteers for review of sections. Spreadsheet commenting or track changes is acceptable

Section 2 – Josh Lamb and Don Fentie

Section 3 – Ryan McDaniel and Sandro Aquiles and Robert James

Section 4.1 - 4.2 – Abel Gonzalez and Sebastian Billaut

4.3 – 4.6: Ted Warren – Joshua Hughes – Fred Agyekum

4.7: Jeff Barsch - Nathan Doak

5: Alla Deronja – Brandon Lewey – Juan Pineros

Appendix A – Joshua Hughes – Alla Deronja

Appendix B – Chris Walker – Brandon Lewey – Abu Zahid

Ritwik and Pratap will send Ted Warren comments on his section.

D42: Revise IEEE Std C37.113-2015, IEEE Guide for Protective Relay Applications to Transmission Lines
Minutes for the 05/09/2023 meeting from 2:20 to 3:30 PM PDT

Chair: Jeffrey Barsch

Vice Chair: Rick Gamble

Secretary: Josh Lamb

Output: Guide

Established Date: 5/5/2020

Expected Completion Date: 2024

Draft: 1.14

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

- a) Officers presiding – Jeff Barsch, Rick Gamble, and Josh Lamb
- b) Officer recording minutes – Josh Lamb
- c) Call to order – Jeff Barsch
- d) Chair’s remarks – Copyright and patent slides presented. No issues identified.
- e) Results of call for quorum – Quorum achieved with 22 of 39 voting members
- f) Approval of Agenda (motion and second) – Don Lukach 1st, Mat Garver 2nd.
- g) Approval of Minutes of previous meetings (motion and second) – Chris Walker 1st, Alexis Mezco 2nd.
- h) Brief summary of discussions and conclusions including any motions.
 - a. Discussed comment in subclause 4.8.2 regarding use of the term ‘relays’ in the guide. Multiple options were presented and discussed with a resolution to clarify the term 'Relay' and its use in an early Section of the guide with 20 in favor and 1 opposed.
 - b. Reviewed section 6.3.6 submitted by Ryan McDaniel and edits to 6.5.3 and 6.5.5. by Ryan McDaniel.
- i) Action items:
 - a. Figures in need of work: 2/22/2023 email to Steve Conrad & Charlie Sufana – Charlie and Steve to discuss offline and complete by end of June.
 - b. Kamal Garg, Steve Conrad, and Ilia Voloh to review section 6.9 by end of June.
 - c. Chris Walker and Ritwik Choudhury to complete edits to 5.2 and any other subclauses which refer to SIR.
 - d. Review of correct/incorrect words to be completed by Jeff Barsch.
 - e. Terminology review
- j) Recesses and time of final adjournment: Adjourned by Jeff Barsch at 3:30 PM PDT.
- k) Next meeting date and location at: Online meetings to be held on the first and third Thursdays of each month from 11:00-12:30 ET via Teams starting June 1st; next in-person meeting to be in Sept 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: September 2024 (updated)

Draft: 1.1

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 May 10, 2023 at 08:00-09:10AM EST. There were total of 11 attendees (6 members and 6 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) The meeting started with the introduction. The Chair explained the requirements for membership, which is attending 2 out of the last 4 meetings.
- b) The Chair provided an update on the latest status of the report. It was explained that the report has gone through editorial review by Don Lukach. The chair also clarified that most of those edits were accepted.
- c) While majority of comments were addressed, the team discussed some of the newer comments added to the report (by Juan G.).
- d) The chair announced that the final version will be sent to the WG members for votes.
- e) Between this meeting and September meeting, there may some calls to address comments received by WG members. The goal is to send the report D-subcommittee after the September meeting.
- f) The meeting was adjourned at 09:05AM.

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 May 9th, 2023, at 5 PM ET, Face-to-face 18 attendees.

9 voting members were present out of 20 current voting members, so **the quorum was not met.**

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

Vice-Chair Karl Zimmerman recorded minutes.

Discussed and recapped previous D44 online meetings

Timeline for Guide: June 2023 Update bibliography and figures, July 2023 WG vote, July 31, 2023 IEEE SA ballot process commences

We discussed making the Excel spreadsheets "informative" references rather than be part of the guide, and making them available online. Dan Sabin offered to assist in making the Excel spreadsheets available via what he called "open source". (hosted by IEEE and or PES)

Discussed SA balloting process.

Discussed the Emerging Technologies Annex C and whether to remove two paragraphs from bottom of page 13 since they are outdated

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 5/09/23 at 3:40pm (Pacific USA Time)

Members = will be adjusted based on attendance and participation

Attendance = 35, (face-to-face, non-hybrid meeting)

Jonathan opened the meeting with the following:

- a discussion about Patent infringement (slides provided from leadership),
- the agenda,
- reviewed the minutes from the last WG,
- introduced Bogdan Kasztenny who provided a presentation and lead a discussion titled: **Solving Complex Feeder Protection Challenges and Reducing Wildfire Risks with Remote Measurements**,
- Discussed the possibility of including the concept as presented in the paper.
- a discussion about the status of each section from the team leads,
- Panelists were acknowledged for panel session on wildfire mitigation at the IEEE PES General meeting in Orlando (Hugh Borland, Jeff Dagle, Daqing Hou, Daniel Ransom, Jonathan Sykes-moderator).
- next steps where Scott will solicit support from several members to create a first draft by the end of June.

Draft – no overall draft yet but all sections have drafts. 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: 4.4

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 20 voting members, 2 non-voting members, and 21 guests on Wednesday, May 10, 2023, at the IEEE PSRC May 2023 meeting. One guest joined the WG as a voting member and four 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: Chris Walker, 2nd: Ken Fodero. There were no objections.

The quorum was met, so the WG voted to approve the JTCM Jan 11 and the Jan 23, Feb 20, Mar 20, and Apr 24 webex meeting minutes. Motion: Don Ware, 2nd: Joerg Blumschein.

The Chair mentioned 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 *Communication channel considerations* is being restructured and extended, so there is a lot of new material that is being presently reviewed.

Based on the made progress, the Chair proposed to continue with the monthly Webex meetings during the summer of 2023. If need be, we will switch to bi-weekly Webex meetings after the PSRC September 2023 meeting.

The WG proceeded to address the technical topics that arose during the winter-spring 2023 webex meetings and required a WG quorum for their resolution.

A question was raised concerning the placement of 5.3.3 *Digital current measurements using IEC 61850 sampled values* because it does not appear to fit in Clause 5 *Current differential operating methods*. One option was to move the 5.3.3 material to Clause 7 dealing with LCD application considerations. The reasoning was that it discusses such issues as CT saturation that is already being addressed in Clause 7. The second option was to create a separate clause for the 5.3 material titled *Current measurement techniques* that includes 5.3.3 and make it Clause 4 *Current measurement techniques*, thus placing it before Clause 5 *Line current differential operating methods*. This appears as a natural flow of the guide material. As an example, a similar approach was taken in the C37.234 bus protection guide outline where a clause for relay input sources precedes a clause on bus protection methods. The WG agreed to implement the second option in the guide.

Another topic was concerning the definitions for *jitter* and *wander*. They are defined in ITU-T G.801 (ITU stands for International Telecommunication Union), but we may want to define them in the guide.

The ensuing discussion led to clarifying the definitions of jitter and wander in the text of 6.1.6.3 *Delay variation* and a decision to keep them consistent with ITU-T G.801. At the same time, it was proposed to verify delay variations that the relays from different vendors can withstand.

The guide mentions the general delay asymmetry value of greater than 2ms in 6.1.6.4 *Delay asymmetry*. It is beneficial to provide a typical value, but it may not be the same for every protection device. Therefore, a proposal was to provide a range, instead.

According to WG H32 technical report, *Channel Performance Considerations for Ethernet Circuits Applied to Teleprotection*, this range is between 0.5ms and 2ms. Beyond 2ms, other factors may need to be considered. It was agreed to provide this range in the guide with a reference to the H32 report.

Because pilot wire is not a digital but analog communication channel, it was proposed to remove 6.2.2.3 *Pilot wire* from the document. This material appeared to be outside of the guide's scope. However, at the meeting, a participant mentioned that a copper-based channel can be used with digital communications. It is not used as a physical analog signal but serves as a medium for digital communications.

Therefore, it was decided to keep this material in the guide for now and review per the discussion at the meeting.

Action Items:

1. The following WG members will verify delay variations (both jitter (fast) and wander (slow) with requested due date: June 10, 2023.
 - a. **Mike Kockott** for the Hitachi relays.
 - b. **Andre Mello** for the Schneider Electric relays.
 - c. **Don Fentie** for the SEL relays.
2. **Mike Kockott** will review 6.2.2.3 *Pilot wire*. Requested due date: June 15, 2023.

Outstanding Action Items:

1. **Gayle Nelms** will contribute new material to 6.1.9 *Cybersecurity*. Requested due date: May 1, 2023.
2. **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.
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.
4. **Galina Antonova** will attempt to find material for 6.2.2.4 *Digital PLC*. Requested due date: September 1, 2023.

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

We request a meeting at the September 2023 meeting with a room for 50 and a projector. Please avoid conflicts with C48, K31, D42, CTF52, and I2.

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

Chair: Kamal Garg

Vice Chair: Ilia Voloh

Secretary: N/A

Output: Report

Established Date: Sep 2021

Expected Completion Date: Dec 2024

Draft: May 10, 2023

Date: Wednesday, May 10, 2023

Time: 10:40 – 11:50 AM (PST)

Venue: PSRC, Las Vegas, Nevada

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

1. Seventh meeting of D48 working group in a single session with 25 attendees. 11 out of 26 members were in attendance. Meeting minutes will be sent for approval via email.
2. Short discussion on outline and sections remained. Most of the sections are written but requires final review.
3. Samir Dalal from Siemens presented on section written on IBRs (Type 3/Type 4) and various

considerations from reclosing. Good discussion, however additional follow-up and discussion required on this topic. Following people requested to review the proposed writeup.

- Joerg, Daqing, Mike Kockott, Fernando, Mukesh Nagpal. (Kamal and Ilia to send draft)
4. Discussion on chapter 8 – Daqing presented the outline – Circulate draft copy- If anybody has comment provide feedback.
 5. Discussion of chapter 9 (David and Fernando Finalized this section)- Ran out of time so this section was not discussed. May be discussed in next meeting.
 6. Short discussion Section 10 breaker failure (Fernando Calero)- Some discussion about amount of details between here and BF standard C37.119. Draft will be circulated for members to review and provide comments.
 7. Lin Ding presented briefly to update Annex A and MH protection practice for single-phase trip. These updates are included for members to review and provide comments.
 8. Adjourn 11.50 AM PST.

Voting Members

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

Non-voting Members

David Jacobson
Davis Erwin

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

Chair: Manish Patel **Vice**

Chair: Joshua Lamb

Secretary: Miguel Rios

Output: Summary paper

Established Date: May 2022

Expected Completion Date: December 2023

Draft: 4

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

The WG met on May 9th, 2023, at 10:40 am PT with 13 members and 12 guests. A quorum was achieved.

Officers presiding – Manish Patel, Joshua Lamb & Miguel Rios

Officer recording minutes- Miguel Rios

The January 2023 WG meeting minutes were approved.

Draft 3 of the summary paper was send to the Subcommittee (SC) D for review and approval after the January 2023 WG meeting. The SC-D members approved draft 3. Some editorial comments as well as comments seeking clarification were received. At the meeting, the WG reviewed redlines to draft 3 that addressed comments received from SC-D members. The WG members agreed with all changes.

The next step is to submit the summary paper to the PSRC Main Committee officers for review and approval. The WG plans to meet in September 2023 to resolve any comments from the PSRC Main Committee officers. Manish Patel will put together an initial draft of the presentation before the next WG meeting. The WG members plan to review this draft presentation at the next meeting.

The abstract of this summary paper was submitted to the 2023 WPRC and MIPSYCON. The paper was not accepted for the WPRC, and the response from MIPSYCON has not been received yet. High Borland requested the WG members to fill out a survey titled “Ground fault mitigation – system suitability survey”. Manish will send out a survey with meeting minutes.

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: January 2023

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 January Task Force Meeting Minutes
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
 - Reference Search for papers, reports, etc. related to Single Phase Tripping and Reclosing of Distribution Lines
 - Presenting experience, practices, operations, etc. at next WG Meeting
5. Report overview & discussion – Brian Boyse

Minutes:

- The D51 Working Group met at 13:00 on 5/9/23.
- There were **26** people in attendance (13 Members and 13 Guests).
- Meeting minutes from the January meeting were reviewed.
- Preliminary Outline was reviewed. Items of note that were discussed included:
 - o Introduction (Section 1)
 - o Benefits of Single Phase Tripping (Section 2): Improve Reliability
 - o Protection Considerations and Challenges (Section 3): Ground Fault Protection and coordination for evolving faults and reclosing
- Assignment progress for various sections:
 - o 1.0 Introduction – Brian Boysen (Assignment completed)
 - o 2.0 Benefits and Reliability – Swagata Das and Kamal Garg (Assignment completed)
 - o 3.1 Ground Fault Protection – Greg Ryan and Brian Boysen (Assignment completed)
 - o 3.2 Coordination with upstream and downstream 3ph devices - Sudarshan Byreddy and Jack Jester (Assignment completed) Jack Jester will write up on adaptive settings for 1PT-1LO.
 - o 3.3 Hot Line Work / Arc Flash – Tentative: Craig Holt and Brian Boysen
 - o 4.1 Three Phase Customer Loads – Don Lukach and Bruch Makie (Assignment completed)
 - o 4.2 DA – Aroundai Chanda and Greg Ryan
 - o 4.3 Phase Load Inbalance – Brian Boysen will review.
 - o 4.4 Delta Connected Transformers and Capacitors – Adi Mulwarman and Brian Boysen
 - o 4.5 Fallen Conductors – Kamal Garg and Brian Boysen
 - o 4.6 Substation Inbalance – Open
 - o 4.7 DER - Open
 - o 4.8 Operational Considerations - Open

Meeting Requirements for September

Room for 35 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

D-Subcommittee Balloting:

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

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

New Business

Normann Fischer proposed to start a task force in September to investigate transient (time-domain) technology for protection of both transmission and distribution lines.

Steve Conrad made a motion to create this Task Force, to investigate line protection based on transient quantities. Gary Kobet seconded. The motion passed with no opposition.

Task Force DTF52 will meet in September in a single session in a room for 50 people. The DTF52 chair will be Bogdan Kasztenny.

The SC D chair asked for the interest to conduct an industry survey for distribution protection practices. The last such survey was conducted in 2002. It appears beneficial since technology has significantly changed over the years although in past it was hard to get responses. The purpose of the survey is information gathering.

Brian Boysen made a motion to create Task Force DTF53, to investigate a need for a new distribution line protection practices industry survey. Scott Hayes seconded. The motion passed with 20 members in favor, 1 objection, and 1 abstention.

Task Force DTF53 will meet in September in a single session in a room for 20 people. The DTF53 chair will be Greg Ryan.

General Discussion

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

Line protection operations of interest

None

Adjournment

H: RELAYING COMMUNICATIONS SUBCOMMITTEE

Chair: Aaron Martin

Vice Chair: Hugo Monterrubio

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

The H SC met on Wednesday May 10, 2023, in person in Las Vegas, NV with 23 members and 22 guests. Quorum was not met so approval of January minutes and motions for WGs H27, H41 and H46 will be submitted for electronic vote by the SC members.

Announcements

1. New items from May 2023 AdCom Meeting
 - a. May 2023 Las Vegas: 246 PSRC Attendees with 13 new first-time attendees
 - b. Reminder to create profile in member planet. Attendance tracking to occur this summer. Training to be provided via Webex later this summer. It will be recorded for those who can't attend live.
 - c. Online meeting to be scheduled in August for PSRC MC members to discuss revised P&P, and O&P for a vote to be taken later.
 - d. A number of entity projects continue to be put forward for PSRC participation. Processes have been put together by PSRC Officers to follow when dealing with entities and proposals and how they may or may not fit the PSRC.
 - e. ADCOM attendees discussed extending SC meetings from the current 1 hour and 20 minutes. HSC will be scheduled at the end of the day in September to allow for an additional fifteen minutes as we often have the most business with the number of WGs.
 - f. Main Committee Meeting tomorrow will start at 7:30AM. Continental breakfast will be offered.
 - g. Parking announcement – If you stay at the Flamingo and paid to park your car you will be getting a refund as parking was to be included in our package.
2. New items from Awards and Recognition Meeting
 - a. Reminder that awards for completed work with Standards or Guides should be requested directly from IEEE SA by the WG Chair or VC. These awards can be shipped to our September meeting for distribution during our next Awards Ceremony on Monday September 18, 2023
3. New items from SC and reminders carried from prior meetings:
 - a. SC Members are required to vote on reports and motions. This is an important part of our process and a requirement to publish reports.
 - b. Share File System space available for Non-PAR WGs. PSRC Officers have organized documents depository for non-PAR WGs
 - c. WG presentations to be reviewed by SC Officers
 - d. Upon work completion, prepare a presentation to the MC
4. Standards Nearing Expiration (2023 or earlier):
 - a. H22 - PC37.249 - Guide for Categorizing Security Needs for Protection and Automation Related Data Files
 - b. H27 - PC37.251 - Standard for Common Protection and Control Settings or Configuration Data Format (COMSET)

- c. H40 – PC37.1.2 - Recommended Practice for Databases Used in Utility Automation Systems
- d. H41 - P1646 – Standard Communication Delivery Time Performance Requirements for Electric Power Substation Automation (D. Dolezilek)
- e. H46 - PC37.1.3 - Recommended Practice for Human Machine Interfaces (HMI) used with Electric Utility Automation Systems

WG Business

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

Working Group Meeting Reports

H6: IEC 61850 Application Testing

Chair: C. Sufana

Vice Chair: B. Vandiver

Output: Summary Paper

Established: January 2021

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

Tuesday May 9, 2023 Las Vegas, NV room: Virginia City 2
3:40 PM – 4:50 PM PDT

- A. Introductions
- B. IEEE Patent slides
- C. IEEE Copyright slides
- D. Approval of previous meeting minutes
- E. Summary paper review

Voting members:

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

Non-voting members

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

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

This meeting was in-person and was also on Zoom.

There were 5 voting members, 0 non-voting members, and 5 non-members present.

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

Chairman Charlie Sufana indicated that he had cleared about 75% of the comments prior to the meeting. However, there were about 30 comments that warranted working group review. H6 was able to get through about 20 comments and develop resolutions. The remaining comments will need further review.

The working group will meet at the next PSRC meeting to go over the summary paper. For the next meeting, we will meet in a single session in a room for 25 to 30 people, and with a computer projector.

Charlie Sufana
H6 Chair

Voting members attending: 5 out of a total of 18 voting members

NAME	AFFILIATION
Jason Bueno	GE
Herb Falk	
Charles Sufana	Retired
Benton Vandiver	ABB
Jun Verzosa	Doble Engineering

Non-voting members attending: 0 out of total of 14 non-voting members

NAME	AFFILIATION

Non-members attending 3

NAME	AFFILIATION
Alex Apostolov	Omicron Electronics
Dave Dolezilek	SEL
Hugo Monterrubio	Hubbell
Nelson Perilla-Sanchez	New Columbia Solar
Samuel Santos Morbin	Siemens

H17: Establishing links between COMTRADE, IEC 61850 and CIM**Chair: C. Brunner****Vice Chair: A. Apostolov****Output: Report****Established: 2010****Expected completion date:**

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

H17 did not meet.

H22/C19: Guide for Categorizing Security Needs for Protection Related Data Files**Chair: Amir Makki****Vice Chair: Cesar Calix****Secretary: Hugo Monterrubio****I-Meet Administrator: T.W. Cease****Output: Guide - PC37.249****Established: January 2014****Expected Completion Date: December 2022****Expected Final Draft: 8.20**

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

The H22 Comment Resolution Group met online and completed addressing the comments from IEEE-SA. The results will be submitted back to IEEE-SA along with a request to start the second ballot in June. H22 WG plans to meet in person at the next PSRC meeting. A room for up to 20 attendees is requested along with a projector.

H27 PC37.251, Standard for Common Protection and Control Settings or Configuration Data Format (COMSET)**Chair: Mario Capuozzo****Vice Chair: Benton Vandiver****Secretary: Dan Sabin****Output: Standard****PAR Approval Date: 05 Feb 2016****PAR Expiration Date: 31 Dec 2023****Status: Initial IEEE SA Ballot (Closes on June 8)**

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

Call to Order: The meeting was called to order by Mario Capuozzo at 2:25 PM. Meeting minutes were recorded by Dan Sabin.

Quorum: 6 of 14 working group members attended, which did not result in quorum.

Initial IEEE SA Ballot: Malia Zaman from IEEE Standards Association attended the meeting and assisted the chair in submitting the initial IEEE Standards Association ballot. PC37.251/D23 was uploaded with the ballot request. The initial SA Ballot opened on May 9 and will close on June 8.

Comment Resolution: Comments received during the initial SA Ballot should be resolved via a web meeting in August.

PAR Extension: The working group discussed the need to file an extension for the PAR since it would be unlikely that the working group can submit a successfully balloted draft before the October 16 deadline. Deadlines to file a PAR extension for the rest of the year are May 19, August 11, September 13, and October 16. Consensus in the working group was that a PAR extension should be developed for the IEEE PES PSRC committee meetings on September 18-21.

Working Group Paper: The working group discussed a paper that could be developed to summarize IEEE C37.251 upon completion. Several industry conferences were discussed where the completed standard could be promoted as well.

Next Meetings: The next meeting of the H27 PC37.251 Working Group should be a web meeting in August. A doodle poll will be sent in June to identify the meeting date and time. The H27 PC37.251 Working Group will meet also in person at the IEEE PES PSRC committee meetings on September 18-21 in Myrtle Beach. See <https://www.pes-psrc.org/meetings.html> for more information.

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

Adjournment: The meeting adjourned at 2:55 PM.

Action Items:

- The chair will submit a PAR extension to IEEE NesCom.

Attendee List:

First Name	Last Name	Affiliation
Alex	Apostolov	Omicron Electronics
Mario	Capuozzo	Doble Engineering Company
Herb	Falk	Outside the Box Consulting Services
Joel	Green	SISCO
Deepak	Maragal	Eureka Power Solutions
Andre	Melo	Schneider Electric

First Name	Last Name	Affiliation
Charles	Pestell	Powell Industries
José	Ruiz	Doble Engineering Company
Daniel	Sabin	Schneider Electric
Benton	Vandiver	Hitachi Energy
Marcos	Velazquez	Doble Engineering Company
Don	Ware	Qualus
Malia	Zaman	IEEE Standards Association

H30: IEC 61850 User Feedback Task Force Meeting Minutes

Chair: D. Maragal

Vice Chair: D. Tessier

Secretary: A. Martin

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

Established: September/2014

Estimated Completion Date: Ongoing

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

Meeting conducted with 10 Members and 8 Guests

Chair discussed the scope and objective of H30 working group.

Dustin discussed the concerns of mixed system operation of 9-2LE/9-2 Edition 2.1 and pointed out mismatch in the standards and associated compatibility issues. The specific issues related to 9-2 LE were highlighted. Dustin completed the slides indicating that users should not indicate 9-2LE in their scope anymore, as this could lead to potential interoperability issues.

Herb Falk, Alex, Andre, and others in the meeting noted that the manufacturers have different implementations beyond the original 9-2LE profile. For ex: Simulation behavior was introduced only on Ed-2, while 9-2LE was defined with Ed-1 standard. However, manufacturers all support 9-2LE profile of Ed-1 with the Simulation behavior of Ed-2.

In conclusion, the chair suggested providing clear guidance to users in one of the future sessions on what is compatible and what is not with different versions and profiles of the standard, and providing the guidance on upgrade path to the users.

The chair brought up the discussion of bringing the Centralized Protection System experiences in the next few meetings. Some expressed concern about whether it was too early or in the scope of H30. Chair made clear that the intent is to share real-world experiences in a vendor-neutral way on what worked, what did not work, and what the lessons are. Another member suggested working with another working group P21 which was building a roadmap for virtualization and centralized protection system. Chair agreed that there could be collaboration and would work with P21 chair on the next steps. However, the

scope of P21 is to develop a roadmap, while the scope of H30 is to share experiences and best practices on IEC 61850 technology.

H31: Common Protection & Control parameters for COMSET

Chair: D. Maragal

Vice Chair: A. Apostolov

Output: Report

Established: September 2015

Estimated Completion Date: September 2022

Draft: 6

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

Meeting conducted with 8 members and 2 guest

Chair discussed the following concerns

- 1) Lack of participation and support from relay manufacturers
- 2) Different people attending from manufacturers in 2-3 sessions

Thus the proposal was made to deliver the results of the work with the progress made so far on the model with the following details:

- 1) Object models of Pxxx, Rxxx logical nodes
- 2) Consolidated list of around 214 unique parameters of Pxxx, Rxxx
- 3) Excel sheet for reference of the model

The group discussed the comments and agreed to conclude in next 1-2 sessions as report as this report serves as good training/reference for users of IEC 61850 standard.

H40: Databases used in SAS

Chair: T. Laughner

Vice Chair: M. Capuozzo

Output: Guide

Established: 2017

Expected completion date: December 2022

Draft: D2

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

The H40 Subcommittee met on Tuesday with quorum. Previous minutes were approved. Draft 7 of the guide was reviewed and edited during the meeting. Draft 8 was subsequently posted to the iMeet workspace. The PAR expires in December of 2024. We expect to request the guide go to ballot in the September PSRC meeting.

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

The WG met on Tuesday, with 5 of 10 members present and 6 guests in attendance. We mistakenly decided that a quorum was present.

Chair David Dolezilek, acting to run the meeting in Aaron's absence, called the meeting to order and Mike Dood offered to volunteer as secretary. Everyone introduced themselves and their affiliation.

Copyright Slides, Participant Slides and Patent Slides were presented to the group without discussion or objection.

Tom D motioned to approve the minutes from May 2022 and Mike Dood 2nd. Passed unanimously.

Since this was the first meeting without Dennis, Dolezilek referenced Dennis's contributions and said that the group was thankful.

Dolezilek mentioned that he will contact those previously listed as members to see if they still have an interest in participating/contributing.

We started looking at the latency reference model (Figure 1)

Dave is suggesting we use the ping-pong test as defined by WG10 as a tool.

Discussed if we want to also include how long IEDs take to sense an input and actuate an output.

Tom D will write up a description of determining how to test 'I' in the latency reference model.

Dave D will rewrite the description of the latencies of the IEDs.

Chris Huntley pointed out that it will be more accurate to replace the word *skew* with *jitter* and consider adding description of *wander*.

We agreed to ask for a 2-year PAR extension.

Jay moved to adjourn the meeting and Tom 2nd.

Attendee List

Members		
David Dolezilek, Chair	SEL	X
T W Cease	Consultant	
Craig Preuss	B&V	X
Jun Verzosa	Doble	
Malcom Swanson	INIVEN	X
Eric Thibodeau	Hydro-Quebec	
Bruce Muschlitz	NovaTech	
Jay Herman	EPRI	
Mike Dood	SEL	X
Tom Dahlin	SEL	X

Members		
Guests		
Anthony Johnson	SCE	X
Hugo Monterrubio	Beckwith Electric	
B. T. Jang		
Malia Zaman	IEEE	
Jay Anderson	SEL	X
Chris Huntley	SEL	X
Ken Fodoro	SEL	X
Emmanuel Duvelson	Hubbel	X
Jeff Dagle	PNNL	X

For future meetings, H41 will need a room for 20 people with supporting projector and teleconferencing capability.

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

Chair: Aaron Martin

Vice Chair: David Dolezilek

Secretary:

Output: Guide

Established Date: 2018

Expected Completion Date: 2024

Current Revision: 4.0

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 in person with 9 of 17 members, 12 guest attendees in person, and no option for online attendance.

Co-chair David Dolezilek, acting to run the meeting in Aaron’s absence, called the meeting to order and Dean Ouellette offered to volunteer as secretary. Everyone introduced themselves.

Quorum was met.

Copyright Slides, Participant Slides and Patent Slides were presented to the group without discussion or objection.

The January meeting minutes were discussed. Dean moved Alex seconded and voice vote approved the motion to accept the minutes.

The group discussed new business which included comments submitted on a pre-draft document. Comments were limited to Scott Mix via excel spreadsheet and Craig Preuss via a word document.

Dolezilek asked if Scott and Craig were comfortable with the group starting with their comments as they had been submitted prior to the meeting.

They agreed but after the data project or failed, we resorted to discussing but not viewing comments as a group. It was recognized that a large number of comments were related to the difficulty in using the format of the present draft. Craig suggested that we first address the formatting challenges to get the document more user friendly. The group agreed to suspend review of the comments and instead we agreed to select a technical editor to work with a small group to create a first draft to be reviewed by the group. David Dolezilek agreed to share this decision with Aaron.

Craig Preuss offered to act as technical editor and the group accepted his suggestion. Scott Mix, Nestor Cassillo, and Jose Ruiz offered to work with Craig and Aaron.

It was discussed that our new target is to have this initial review completed by September., Dolezilek tabled discussion of comments, Scott Mix moved to adjourn, and Dean Ouellette seconded. The motion passed a voice vote.

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

Members		
NAME	AFFILIATION	
Alex Apostolov	Omicron	X
Nestor Cassillo	Doble	X
Eugenio Carvalheira	Omicron	
David Dolezilek	SEL Inc.	X
Aaron Martin	BPA	
Herbert Falk	Outside the Box	X
Scott Mix	PNNL	X
Ryan Newell	TRC Companies	
Dean Ouellette	RTDS	X
Jose Ruiz	Doble	X
Craig Preuss	Black and Veatch	X
Arun Shrestha	SEL Inc.	
Dustin Tessier	Tesco	
Benton Vandiver	Hitachi	X
Jun Verzosa	Doble	
Emmoji Vundekari	GE	
Karen Legget-Wyszczelski	SEL Inc.	
Guests and Past Guests		
Abel Gonzalez		
Amin Banaie	GE	
Alexander Praticzka	Hitachi Energy	
Andre Melo	SE	X
Andre Uribe	Powergrid	

Angelo Tempone	Duke Energy	
ArundoDai Chanda	Burns McDonnell	
Byungtae Jang	Naver	
Bharat Nalla	SEL Inc	
Charles Pestell	Powell	X
Christoph Bruner	It4power	
Dan Ransom	GE	
Daniel Nordell	Xcel Energy	
Darren DeRonde	Tesco Automation	X
Dinesh Gurusinghe	RTDS	
Emmoji Vunderkari	GE	
Farzad Khalilpour	GE	
Fernando Calero	SEL Inc	
Gayle Nelms	SEL Inc.	
Greg Zweigle	SEL Inc.	
Hani Al-Yousef	Eaton	X
Hugo Monterrubio	Hubbell / Beckwith	
Jack Wilson	Ameren	
Jay Shumar	Hitachi Energy	
Jesse Sliva	SCE	
Jeff Dagle	PNNL	X
Jeff Pack	Power Engineers	X
Jim Hackett		
Joe Xavier	ABB	
Joel Green	SISCO	X
Jorg Blumshein	Siemens	
Marcos Velazquez	Doble	X
Mario Capuozzo	Doble	
Matt Black	Sargent Lundy	
Michael Cunningham	Powergrid	
Mital Kanibar	GE	
Mohit Sharma	SEL	X
Nelson Perilla-Sanchez	NCS	X
Nicholas Kraener	National Grid Power	X
Nuwan Perera	Earlphase	
Priyanka Nadkar	SEL Inc	
Pail Myrda	EPRI	X
Rich Hunt	Quanta Technology	
Romulo Bainya	University of Idaho	
Safety Pepljak	YRC Companies	
Shane Haveron	Ametek	
Thai Li	Hubbell	
Thomas Rudolph	SE	
Wayne Pawley	Sisco	
Xiangyu Ding	S&C E	
Yanfeng Gong	SEL Inc.	
Yuchen Lu	ERPI	

Yujie Yin	GE	
Wang Zitao		

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

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

Chair: R. Das

Vice-Chair: P. Myrda

Secretary: M. Kanabar

Expected Output: Guide

Established: 5/18

Expected Completion Date: 12/2024

Draft: 5.0

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

(Face-to-face) Meeting # 40 (May 10, 2023) Notes

The working group met on May 10, 2023 with 49 attendees - 13 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.

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

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

Vice-Chair informed that minutes of the last WG meeting held on April 14, circulated via email dated April 17, 2023, were approved without any modifications. Vice-Chair also provided status of the IEEE Ballot Group formation and invited more SA members to sign-up to participate in the ballot group by May 18, 2023.

Vice-Chair also provided the information on IEEE MEC progress.

Discussion was then held on comment ID 6-4-3 based on comments from Jay Anderson. It was agreed that "61850-9-2LE" will be deleted from Row 1 of Table 1 and the statement "9-2LE is one possible communications profile available under IEC 61869-9." will be added to Note 1 as a second sentence.

Alex Apostolov was requested again to provide the source of Figures 15 and H.1 through H.5 along with source files within a week's time – an important requirement to complete the IEEE MEC process.

WG will meet during the PSRC meeting in September 2023 at the same time slot. Any virtual meeting, prior to the September meeting, will be announced to the WG members and interested parties.

Meeting was then adjourned.

Sincerely,

Ratan Das Paul Myrda Mital Kanabar

						Annex I
Members						
#	Role	First Name	Last Name	Affiliation	Present	
1	Chair	Ratan	Das	GE Gas Power	No	
2	Vice-Chair	Paul	Myrda	EPRI	Yes	
3	Secretary	Mital	Kanabar	GE Renewable Energy	Yes	
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	No	
11	Voting Member	Erin	Jessup	SEL	Yes	
12	Voting Member	Jack	Jester	Exelon	Yes	
13	Voting Member	Chikashi	Komatsu	Hitachi	No	
14	Voting Member	Raluca	Lascu	DTE	No	
15	Voting Member	Yuan	Liao	U of Kentucky	No	
16	Voting Member	Vahid	Madani	GridTology	Yes	
17	Voting Member	Sakis	Meliopoulos	Georgia Tech	No	
18	Voting Member	Hugo	Monterrubio	Beckwith	Yes	
19	Voting Member	Bharat	Nalla	Amazon Web Services	No	
20	Voting Member	Damir	Novosel	Quanta Technology	No	
21	Voting Member	Craig	Preuss	Black & Veatch	Yes	
22	Voting Member	Qun	Qiu	AEP	No	
23	Voting Member	Jean	Raymond	Hydro-Quebec	No	
24	Voting Member	Thomas	Rudolph	Schneider Electric	No	
25	Voting Member	Jose	Ruiz	Doble	Yes	
26	Voting Member	Arun	Shrestha	SEL	No	
27	Voting Member	Harsh	Vardhan	GE Renewable Energy	No	
28	Voting Member	Austin	Wade	SEL	Yes	
29	Voting Member	Joemoan	Xavier	ABB	No	13
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	1
					Total	14

Guests			
#	First Name	Last Name	Affiliation
1	Romulo	Bainey	University of Idaho
2	Matt	Black	Sargent & Lundy
3	Nestor	Casilla	Doble
4	Jeff	Daggle	PNNL
5	Brandon	Davies	TRC
6	Darren	DeRonde	TESCO
7	Nathan	Doak	SEL
8	David	Dolezilek	SEL
9	Kevin	Donahoe	GE Grid Solutions
10	Glenn	Emelko	Hubbell
11	Herb	Falk	OTB Consulting Services
12	Don	Fentie	SEL
13	Chris	Huntley	SEL
14	Rafael	Garcia	ONCOR
15	Abel	Gonzalez	Megger
16	Daqing	Hou	SEL
17	Chase	Lockhart	Burns & McDonnell
18	Andre	Melo	Schneider Electric
19	Melvin	Moncey J	BV
20	Samuel	Morbin	Siemens
21	Gale	Nelms	SEL
22	Seth	Nelson	Basler Electric
23	Jeff	Pack	Power Engineers
24	Juan	Pineros	XM Columbia JSO
25	Greg	Ryan	Amaren
26	Priya	Raghuraman	Siemens
27	Miguel	Rios	Southern Company
28	Dan	Sabin	Schneider Electric
29	Neil	Saia	Entergy
30	Mohit	Sharma	SEL
31	Eric	Thibodeau	Hydro-Quebec
32	Benton	Vandivier	Hitachi
33	Marcos	Velazquez	Doble
34	Abu	Zaid	
35	Malia	Zaman	IEEE
		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 2024(Tent.)****Draft: v0.57**

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

The chair called the hybrid meeting to order on Wednesday 5/10/23 at 8:00 PDT. There were 16 attendees: 9 out of 12 voting members and 7 guests, achieving a quorum. Prior to this meeting the chair notified voting members who had not satisfied the 4 of the last 6 meeting attendance requirement of voting membership of their de-elevation to non-voting member status. One would expect that with a truncated membership roster that quorum would be more achievable. Even with the paring down of the voting membership, we had inadequate in-person attendance to achieve quorum initially. Mid-stride with the Vice-Chair's assistance, our meeting was converted to a Hybrid format using the Vice-Chair's Microsoft Teams meeting capability. While in-person attendance was the intent of the meeting, ultimately without the hybrid "audible" we would not have been able to conduct any official business. Minutes from the meetings held in May '22, September '22, and January '23 were finally approved.

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

The initial WG ballot on the Recommended Practice yielded 57 comments. Of those comments 14 were categorized as Technical, 25 Editorial, and 18 General. The resolution of these comments is of supreme importance to be able to move forward with the publication process. The chair is going to invite WG members/contributors to a virtual meeting (or series of meetings) to begin working-off the comments.

Given that the PAR expires at the end of the year (2023), the group spent significant time during our meeting discussing necessary steps procedurally. The PAR will need to be extended until December 2025. The language for a motion to the H subcommittee was agreed upon & the motion sent to the H subcommittee leadership.

The final scope of the Recommended Practice is significantly smaller than the originally drafted scope of the PAR. A PAR revision's necessity was discussed and based on input from IEEE-SA, PSRC's Standards coordinator, and PSRC Leadership it has been determined that a PAR revision is unnecessary. So long as the scope is being revised to remove content and not add it, it is NESCOM's preference not to receive PAR requests descoping the project. Though it would be nice to preemptively request & receive subcommittee approval to move the Recommended Practice to IEEE-SA ballot contingent upon resolution of the WG ballot comments, we will have to raise that motion via email to the H subcommittee after the ballot comments have been resolved.

At the next meeting we will request room for 25 with a projector. Please avoid conflicts with D47, I31, J24, H27, H51, H52, C26, & S15.

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

Chair: Mital Kanabar

Vice Chair: Antonio Riccardo

Secretary: Dean Ouellette

Output: Report

Established Date: May 2019

Expected Completion Date: May 2024

Draft: 1.4b

Assignment: In a digital substation Protection and Control (P&C) devices rely on Sampled Values (SV), GOOSE and time synchronization (using Precision Time Protocol, PTP) together over process bus communications. This Working Group will generate a report evaluating the discrepancies in the communication of SV, GOOSE or PTP messages and their impact on protection and control applications such as performance and behavior.

Meeting 9 May 2023, 13:00 – 14:10 PDT at the Flamingo, City Mesquite, called to order 13:00pm. One of the working group officers were present. The Chair presided over the meeting and Dean Ouellette recorded minutes.

The meeting was called to order with 17 in attendance of which 8 were voting members, and 9 guests. Quorum was not achieved.

The agenda was reviewed.

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 and Eric Udren presented IEC TC95 WG2 status update. There are about 400 comments on the current draft. 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, comments and standard IEC comment form. H47 will review comments and provide feedback to Eric and Jorge. The objective of H47 is to not duplicate content of the IEC TS but to compliment it.

Old Business

The Scope and Assignment were reviewed. Names were not given; volunteers know who you are! Volunteers are needed for section I.

New Business

Request for presentation from other members and guests on relevant topics was discussed. RTDS 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.

-H49 didn't meet in May

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: 12/31/2023

Draft: 1.7.2

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 09 May 2023, 08:00 – 09:10 CST at the Flamingo Hotel, Laughlin 3, called to order 08:00am. All working group officers were present. The chair presided over the meeting and Jay Anderson recorded minutes.

The meeting was called to order with 16 in attendance of which 7 were voting members and 9 guests. Quorum was achieved. We noted that we need to remove a couple of non-participating members from the roster.

A motion was made by Robyn Byun to approve the agenda; seconded by Jeff Dagle. 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 IEEE Participant Behavior slides were also shown.

A motion was made by Nicholas Kraemer to approve the January 10, 2023 meeting minutes; seconded by Jeff Dagle. The Minutes were approved.

New Business

Review draft 1.7.2.

Contributions from members (Jay Anderson, Nicholas Kraemer; Nicholas had added info from the P1952 use case docs to the draft) to the document were reviewed and several corrections to those contributions were made. Assignments for additional submissions and corrections were recorded in the draft.

Jay Anderson made a quick summary of the P1952 effort. Jeff Dagle provided additional background including the attempt to define levels of reliability required.

Based on discussions around required timing accuracy in this H50 meeting, the P1952 group will revisit some of the P1952 use case writing assignments.

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

The meeting was adjourned after the scheduled time.

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

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

Avoid Conflicts: P1, S15, C33

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

Chair: Mark Adamiak

Vice Chair: Pierre Martin

Secretary: Zach Makki

Output: Standard Revision

Completion Date:

Current Revision: 2010

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

-H51 didn't meet in May

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

Chair: Ellery Blood

Vice Chair: Shane Haveron

Secretary: Amir Makki

Output: Revision of an Existing Standard

Established Date: September, 2021

Expected Completion Date: December, 2024

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

- a) Ellery Blood (Chair) presiding (remote)
- b) Shane Haveron (Vice Chair) presiding (in person)
- c) Amir Makki (Secretary) recorder (remote)
- d) Call to order
- e) Intellectual Property slides
- f) Chair's remarks
- g) Results of call for quorum
 - a. 6 of 10 members in attendance, quorum achieved
- h) Approval of Agenda (motion and second)
 - a. Theo made the motion to approve.
 - b. Shane seconded the motion.
 - c. Motion passes.
- i) Approval of Minutes of previous meetings (motion and second)
 - a. Theo made the motion to approve.
 - b. Jun seconded the motion.
 - c. Discussion:
 - i. Should ensure we're using the latest H subcommittee minutes template.
 - d. Motion passes.
- j) Discussion
 - a. Ellery – Exploration of use cases.
 - i. Need input from consumers of COMNAME formatted files.
 1. NERC (initial sponsor & use case)
 - a. GA Tech 2001 paper – recommendations for file organization
 - b. Now part of NERC-PRC-002 (COMTRADE & COMNAME)
 2. Utilities (Dominion, TVA, ...)
 - ii. Discussion of Appendix A
 - iii. Impact on file path decision (i.e., can COMNAME fields be omitted from name if encoded in path?)
 1. Including a schema allows a utility to convert from a custom format to standard format for submittal to regulating entity.
 2. For certain events, may desire collecting into sub folders based on station or certain time range.
 3. User fields described in schema.
 - b. Shane – delimiter description

- i. Shane is drafting the initial edits to support flexible delimiters and flexible date format.
 - ii. Review COMTAG (IEEE C37.237) referencing timestamp format.
 - c. Ellery – “time code = 0’ description
 - i. COMTRADE H54 committee is recommending using UTC time (e.g., 0 offset) only. We might consider this as a “should” recommendation.
- k) Action Items:
 - a. Colleen – reach out to Tom Cooke and Yuchen Lu (and other colleagues at EPRI)
 - b. Shane - Coordinate with COMTRADE in containerization of files within COMTRADE package. Same COMNAME format for full package as well as individual files within the container.
 - c. Dan - Determine if there are file/path length limitations within ZIP file.
 - d. Theo – reach out to Duke, TVA, Dominion about use cases
 - e. Theo – study COMTAG
 - f. Ellery – get reference copy of COMTAG C37.237 & post on iMeetCentral
 - g. Ellery - iMeet Central – members to request access to H52 workspace.
 - i. <https://ieee-sa.imeetcentral.com/h52/home>
- l) Adjourn
 - a. Shane – motion
 - b. Amir – second

Attendance List:

Amir Makki (Softstuf Philadelphia) (Member)
 Dan Sabin (Schneider Electric) (Member)
 Ellery Blood (SEL) (Member)
 Hugo Monterrubio (Hubbell) (Member)
 Jun Verzosa (Doble) (Member)
 Shane Haveron (AMETEK) (Member)
 Theo Laughner (Lifescale Analytics) (Member)

Colleen Konsavage (I2-Terminology)(Guest)
 Ethan Grindle (ATC)(Guest)
 Joshua Hughes (Qualus)(Guest)

Appendix A – Exploration of Use Cases / Personas

Self: The entity creating and naming files is doing so for its own consumption.

1. Important to support internal use cases.
2. Might be more useful to organize by device vs. date/time
3. Likely to want sub folders.
4. May need to quickly convert to standard naming if requested by regulating entity.
Must not destroy metadata.

Regulating Entity: Separate entity collecting from one or more creators.

1. Important to be consistent and backwards compatible.
2. Likely to want to sort in a variety of ways.
3. Likely to have the inclination and funding to develop database with programmatic import.
4. Duration or end time may also be important (in addition to trigger time)

Software Database: Programmatic import of files into database.

1. Trivial to adapt to alternate naming conventions if provided schema.
2. Going to associate metadata with record, so actual file name matters less as long as metadata can be extracted.

COMTRADE working group

1. COMNAME is referenced in COMTRADE and we need to make sure we're meeting their needs.

Discussion Points:

Under Consideration:

1. Time Zone – support local time as offset? Assume local time if time zone field is blank?
2. Schema for file name – support flexible naming if schema provided?
3. Standard to further specify field parameters (e.g., length of StationID and DeviceID)?
4. Standard versioning – if no schema, is existing standard. If schema exists, schema includes standard revision year?
5. Date field – support 2 and 4 year format?

Resolved:

1. Delimiter – (Shall) First non-digit character (typically 7th or 9th) in file name.
2. Time Zone – (Should) use 0 for time zone offset (e.g., use UTC).
3. Schema for Folder Structure – (May) May use schema file to define folder structure.

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

Chair: X. Ding, J. Lombardo

Vice Chair:

Secretary:

Output: Guide

Established Date: 09/2021

Expected Completion Date: 12/2023

Current Revision: 20230424

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

The WG met on Wednesday, May 10 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 the latest edits were discussed
- Added benefits section
- Changed a lot in the Distribution Underground System Monitoring and

Control section

- Mentioned there is not a lot of discussion in the other sections about communications needs and how to address that
 - Example: When gathering data from distribution voltage sensors vs. pulling data from AMI data (through MDMS)
 - Craig took an action to draft a paragraph or two on this for consideration
 - Sanjeev said that he could add a new write-up for review for the VVO section
 - Peiman said he can add a new diagram for review and consideration
 - Need to add a paragraph on M&V in VVO section
 - It was suggested that we add more examples in the system architecture section to show how devices and systems are interconnected
 - Sal mentioned he doesn't mind adding some additional content, but we need to set a deadline to get the work done as soon as possible. PAR ends at the end of the year, so we would need to get an extension soon.
 - We also need to give assignments and make sure they are completed before the next meeting
- Jason suggested that we should consider adding new network/communication diagrams to reference in the various sections instead of writing a bunch of new material to cover communications needs/architectures

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	

Jason L. - Phone
 Xiangyu Ding - Phone
 Byungtae Jang - Phone
 Kate Cummings G&W - Phone
 Jay Anderson – SEL (Guest) – In person
 Craig Preuss – Black and Veatch (Member) – In person
 Sanjeev Pannala - Phone
 John Hofman – Phone
 Peiman Dadkhah – In person
 Sal Martino - Phone

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

-H54 didn't meet in May

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.

During our meeting today, the attendees questioned the ability of the TF to complete the work in the remaining time left for the TF. The consensus was to request an extension of the TF, or possibly convert it to a Working Group, to make sure that we have time to:

- Approve the survey for distribution;
- Compile the survey results; and
- Develop the report.

I wanted to check with you to see what your thoughts were. Given the need to get H and PRCC Officers to approve before it goes out, as well as having S0 provide comments prior to the approval, seems to me that will take longer than the September meeting.

Please let me know if you have any questions - thanks.

--

Jeff Pack

jeff.pack@ieee.org

Old Business

- None

New Business

- None

Adjourn

- Motion to adjourn made by Jay Anderson and seconded by Ken Fodero.

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

I SC – Protection and Control Practices* Scope:

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

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

1. Welcome and guidelines for meeting
2. Recognitions:
 - a. Attendee introductions
 - b. Thank guests for attending
3. Many thanks to former members of the I-SC:
 - a. None
4. Welcome to new members of the I-SC:
 - a. None
5. Determine a Quorum (**39 members** total in I SC)
 - a. Attendance: 27 (min 20 for quorum; YES X or NO ___)
6. Approval of Minutes of the January 11, 2023, meeting
 - a. Motion entered by: Hugo Monterrubio
 - b. Motion entered by: Kevin Donahoe
 - c. Motion carried unanimously.
7. Coordination & Advisory Committee Meetings Items of Interest
 - a. Subcommittee Members' status and incoming Officers for January 2023
 - b. Attendee information (approximate)
 - 246 PSRC attendees
 - 13 Newcomers
 - c. Hotel Parking and Breakfast Information
 - Parking is included with the hotel room
 - Continental breakfast at 7 AM before the Main Committee meeting
 - d. *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*
 - e. 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!>

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

- Three officers: Chair, Vice-Chair, and Secretary
- **All WG Officers must be members of IEEE SA**
- f. **Working Group sign-in sheets – use confidential procedure!!!**
 - See instructions on PSRC website for how to create your Working Group roster and attendance list for handout at your meeting. Email addresses are no longer permitted to be placed on your sign-in sheet. Attendees must add their email address when they register for PSRC meetings.
 - Use a spreadsheet to maintain attendance records. Use BCC on email correspondence to maintain confidentiality of user contact information. Attendance roster should contain name and affiliation, but not email addresses, phone numbers, or other contact information.
Begin using new Member Planet Association Management System. You have received an email on March 22, 2023, to set up your profile by April 22, 2023. This allows you to be on the relevant mailing lists. This system will also be used for registration, possibly starting September 2023 PSRC meeting.
- g. For PAR-related work, present the new patent slides and *record in your minutes* whether essential patent claims exist. If there are none, please write this into the minutes. **Do this at every working group meeting.** New JUNE 2021 slides available and are at <http://standards.ieee.org/about/sasb/patcom/materials.html>. To expedite your meeting, send the slides with the meeting agenda so meeting attendees can review ahead of time.
- h. Looking for Webinars to publicize our PSRC work products as part of Global Outreach
 - Availability of WebEx for presentations by IEEE. Every WG that has completed their work is encouraged to present it to the IEEE community through WebEx which will project our work. Please contact Cathy Dalton, Chair of Publicity group or Michael Thompson, Gene Henneberg, or Jim Niemira.
- i. Looking for presentations for future Main Committee meetings – please contact Ritwik Chowdhury.
- j. The PSRC Committee is international and open to anyone who cares to attend.
- k. New “Awards” page on PSRC website—with pictures of recent awards ceremonies
- 8. Administrative Items
 - a. From IEEE-SA: WG/TF Agendas and Minutes: “**The 14-calendar-day rule” – the Standards Association requirement in O&P**”
 - b. Procedure for PARs:
 - All PAR related activities must be approved by the PSRC Main Committee members, although certain activities are now delegated to the Subcommittee
 - See examples provided of how to request at the Main Committee – a Working Group Chair makes a motion at the Subcommittee meeting for the SC Chair to create a slide and then send it to the Main Committee Officers for inclusion on the slide set at the Main Committee meeting. The SC Chair reads the motion (s)



PAR Committee
motion_2020-6-18.p

- Create new PAR for new standard – MC

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

- 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
- c. Review Draft 1 of the PSRC meeting agenda as soon as the meeting notice arrives in your inbox – to avoid meeting conflicts and multiple agenda revisions. Contact Angelo Tempone and Ritwik Chowdhury for your requested changes – we will consolidate them and forward to Jim Niemira.
 - d. As Chair or Vice-Chair of WG or TF, please contact Ritwik Chowdhury and Angelo Tempone **if you cannot attend your session**. Delegate to another member of your WG to preside at the meeting and record minutes.
 - e. Non-PAR-related document drafts can be shared with anyone who is interested. Please add a note that this is a draft version subject to change. Once this document is complete and approved it will be posted on PSRC website which is open to all and/or published on the PES Resource page.
 - f. All PAR-related document (IEEE related) drafts **may not** be forwarded by the WG member to anyone else – there is a public review period for all IEEE documents where anyone can submit their comments.
 - g. When submitting “comments resolution” CSV file back to IEEE-SA in myProject, make sure that your draft is updated to reflect all the changes made – must match up to the CSV file!
 - h. *iMeet Central* (formerly Central Desktop) is to be used for IEEE Guide / Recommended Practice / Standard documents with a PAR
 - i. PSRC has File Share facility for non-PAR documents. Contact Ritwik Chowdhury (I-SC Chair) if your group has need or interest. Need list of participants with email addresses to allow write access - typically only a few people (WG Chair, VC, and/or Secretary); view access can be granted to others. See instructional videos on PSRC Website.

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

- j. Standards WG Awards - The IEEE Standards Association Working Group Awards has a new Procedure to request certificates of appreciation for completed (Approved Standard) work.
- WG Chair or WG VC must request certificates directly from the IEEE-SA. 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!
- k. Reports/Paper Final Output – To be considered for PES level award the output of all Working Groups with a Technical Output including Technical Reports, Transactions / Journal and conference papers must be completed in PES Format and submitted and posted in the PES Resource Center. Final Draft of PSRC Reports, without PES Resource publication number or cover, will also be posted to PSRC Website.
- l. Links to PES:
- PES Technical Resource Center: <http://resourcecenter.ieee-pes.org/>
 - PES Technical Activities Resources and templates: <https://www.ieee-pes.org/technical-activities/committees/resources>
 - PES - Technical Report Template: https://www.ieee-pes.org/images/files/doc/tech-council/PES-Technical-Report-Template_Jan_2019.docx
 - PES - Technical Paper Template: <https://www.ieee-pes.org/templates-and-sample-of-pes-technical-papers>
 - PES Resource Center Submission Checklist with instructions on how to get your report or Paper submitted please use this link: http://ieee-pes.org/images/files/doc/tech-council/Submission_Checklist_PES_Resource_Center.docx
- m. Email WG/TF Minutes to Angelo Tempone at: angelo.tempone@duke-energy.com
PLEASE HAVE THIS IN WITHIN 1 WEEK – USE THE MINUTES TEMPLATE FORMAT PROVIDED ON p. 8 OF THIS AGENDA – confirm WG information is all correct and do not use special formatting or extra indents.
- n. Email any changes to the Meeting Room Request (MRR) form for the *September 2023* meeting to Ritwik Chowdhury at ritwchow@ieee.org, such as

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

scheduling conflicts to avoid, e.g. “do not conflict with I50, D87, ...” etc.
PLEASE SEND ANY UPDATES BY THE END OF THE MONTH.

9. Working Group Reports – about 1 minute each for non-ongoing groups.
What is your status? Are you on track? Do you need help?

WG/TF #	Name	Officer (Spokesperson)
I2 (Ongoing)	Terminology Review	Mal Swanson Claire Patti
I4 (Ongoing)	International Standards Development	Eric Udren Normann Fischer
I26	Review and Expand Transaction Paper on Mathematical Models of Current, Voltage, and Coupling Capacitive Voltage Transformers	Mike Meisinger Steve Turner Amir Makki
I29	PC37.110 – IEEE Draft Guide for the Application of Current Transformers Used for Protective Relaying Purposes – Revision of C37.110-2007	Joe Valenzuela Michael Higginson (Ritwik Chowdhury)
I31	P1613 – Standard for Environmental and Testing Requirements for Devices with Communications Functions used with Electric Power Apparatus – Revision of 1613-2009	Brian Mugalian Jerry Ramie Craig Preuss
I32	A Survey of Protective System Test Practices	Andre Uribe Will Knapek
I33	Review of Relay Testing Terms	Scott Cooper Hugo Monterrubio
I36	PC37.90.2 - Standard for Relays, Relay Systems, and Control Devices used for Protection and Control of Electric Power Apparatus – Radiated Electromagnetic Interference Withstand Capability Requirements and Tests – Revision of C37.90.2-2004	Chase Lockhart Mat Garver
I37	PC37.90 - Standard for Relays, Relay Systems, and Control Devices used for Protection and Control of Electric Power Apparatus – General Requirements and Tests – Revision of C37.90-2005	Marilyn Ramirez Bill Morse
I38	PC37.92 - IEEE Draft Standard for Low-Energy Analog Interfaces between Protective Relays and Power System Signal Sources – Revision of C37.92-2005	Ritwik Chowdhury Eric Udren

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV

Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

I40	PC37.90.1 - Standard for Relays, Relay Systems, and Control Devices used for Protection and Control of Electric Power Apparatus – Surge Withstand Capability (SWC) and Electrical Fast Transient (EFT) Requirements and Tests – Revision of IEEE C37.90.1-2012	Roger Whittaker Todd Martin
I41	PC37.90.3 - Standard Electrostatic Discharge Tests for Protective Relays – Revision of IEEE C37.90.3-2001	Steve Turner Dan Ransom
I43	Investigate response to USA executive order regarding EMP protection	Angelo Tempone Dolly Villasmil Johnny Moore
I44	Investigate and write a report on skill sets required by relay test technicians for setting, commissioning, and testing relay systems, given new technologies such as IEC 61850	Andre Uribe Will Knappek
I45	Investigation of Grounding and Bonding Issues Associated with Substation Wiring Practices and Instrumentation	Adrian Zvarych Jalal Gohari
I46	Review and revise: IEEE C57.13.3-2014 – IEEE Guide for Grounding of Instrument Transformer Secondary Circuits and Cases	Bruce Magruder Sudarshan Byreddy
I47	Review and revise: IEEE C37.231-2006 – IEEE Recommended Practice for Microprocessor-Based Protection Equipment Firmware Control	Don Burkart Nicholas Kraemer Amir Makki
I48	Review and revise: C37.103-2015 – IEEE Guide for Differential and Polarizing Relay Circuit Testing	Mohit Sharma Gary Kobet
I49	Roadmap for developing new or updating existing IEEE standards to address issues of Centralized Protection and Control (CPC) Systems	Craig Preuss Brian Mugalian Melvin Moncey Joseph

I2: Terminology Review

Chair: Mal Swanson

Vice Chair/Secretary: Claire Patti

Output: Terminology recommendations to working groups

Established Date: circa 1995

Expected Completion Date: on-going

Draft: N/A

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

The hybrid meeting was called to order by Mal Swanson, Chair at 10:40 am (PDT) on May 10, 2023, with Claire Patti, Vice-Chair recording minutes with 9 members and 1 guest in attendance. Quorum was achieved.

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

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

Updates were given on each of the assignments. The working group discussed and approved a new definition of neutral reactor for C37.109.

PSCC has formed working group A8 to handle their terminology needs. Benton Vandiver will chair the new working group and A8 will meet jointly with I2 in September.

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

- C37.101: Guide for Generator Ground Protection
- 2004: HIL Simulation Testing Apparatus & Control
- C37.103: Guide for Differential and Polarizing Relay Circuit Testing

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 11:52 am (PDT).

I4: International Standards Development Working Group

Chair: Eric A. Udren

Vice Chair: Normann Fischer

Output: IEC TC 95 USNC standards votes and PSRC status reports

Established Date: 1990

Expected Completion Date: Meetings are continuing.

Assignment: Develop comments and votes for USNC of IEC on TC 95 (Measuring Relays and Protection Systems) standards projects and drafts. Report to PSRC on IEC Standards development.

Attendees: 7 in person, no virtual

Chair Eric Udren called the meeting to order at 8:00 am PST on May 9, 2023

Bogdan Kasztenny is succeeding Gustavo Brunello as the IEC TC 95 Head of Delegation (HOD) for Canada.

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

Travis Mooney is becoming an active member of I4. The vice chair will send Travis the agenda for the May meeting and the minutes of the January meeting.

Standards project business:

- **95/534/Q** - Proposes 300-series functional standards numbering for new functions for which there is no C37.2 number - only a C37.2 acronym or a 61850-7-4 LN name. TC 95 proposes a table of 300-series standards numbers for potential future functional standard projects. I4 attendees supported proposed responses by both Canada and the US to agree to the reservation of the 3xx block for use by TC 95 MT4, but that the proposed project list that aligns the 3xx number with prespecified functions should be removed. 3xx project numbers should not be assigned until specific projects are proposed and scope determined. Eric Udren will respond/vote on behalf of the US national committee and Bogdan Kasztenny on behalf of the Canadian national committee. The NC responses with votes are due to the IEC by 5/12/2023.
- **95/533/AC** - Launch of WG3 on *Functional requirements for the protection of direct current (DC) transmission and distribution networks* – USNC can propose experts until May 19. US DC experts are sought for participation. Brian Johnson from the University of Idaho was proposed as a possible member of WG3; Normann Fischer will reach out to Brian. Reza Iravani from the University of Toronto was proposed; Bogdan Kasztenny will reach out to Reza. Eric Udren will make a call to the Main Committee and will reach out to PSRC Chair Michael Thompson to find possible PES DC experts at Technical Committee forums.
- **95/537/Q** - IEC 60255-187-2 and 187-3 differential relay functional standard projects are being cancelled due SMB policy for projects more than 5 years late. The TC 95 proposal is to obtain NC approval to restart both projects immediately. This questionnaire requests approval from the USNC and others; we intend to approve restart of both projects, and other NCs are likely to do the same. The scopes and outlines for these will need to be revised.
- Status of other TC 95 standards projects was reviewed as summarized in the IEC report in Reports of Interest in these PSRC minutes.

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

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV

Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

I26: Mathematical Models of Current, Voltage, and Coupling Capacitive Voltage Transformers

Chair: Mike Meisinger

Vice Chair: Steve Turner

Secretary: Amir Makki

Output: Report

Established Date: 01/2014

Expected Completion Date: 09/2023

Draft: WG Ballot

Assignment: Recommendation to update and expand mathematical models of instrument transformers and transducers, including interface electronics such as merging units, for use in both off-line and real time transient simulation. There are now new transducer types such as optical, Hall Effect and Rogowski coils in addition to improved models for conventional CTs, VTs and CVTs.

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

I29: Revision of C37.110 Guide for the Application of Current Transformers for Protective Relaying Purposes

Chair: Joseph Valenzuela

Vice Chair: Michael Higginson

Output: IEEE Guide

Established Date: January 2015

Expected Completion Date: December 2022

Draft: D5

Assignment: Revise C37.110-2007 Guide for the Applications of Current Transformers for Protective Relaying Purposes

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

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

**IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV
Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time**

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

Chair: Brian Mugalian

Vice Chair: Jerry Ramie

Secretary: Craig Preuss

Output: Standard

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

Meeting Date: May 9, 2023

Expected Completion Date: 31-Dec-2023

Draft: 3.2

Assignment: Revise 1613

- a) Officer presiding: Brian Mugalian
- b) Officer recording minutes: Craig Preuss
- c) Call to order, approximately 10:00 AM Pacific time
- d) Chair's remarks, general welcome
- e) Results of call for quorum: 10 members in attendance for quorum
- f) Approval of Agenda: Mal Swanson, second Jerry Ramie, passed by unanimous consent
- g) Patent slides were shown, no claims were made
- h) Copyright slides were shown
- i) Participant behavior slides shown
- j) Resolution of comments and edits to the draft were made by those present
- k) Motion to approve ballot comment resolutions – Mal Swanson, second Jerry Ramie, passed by unanimous consent
- l) Motion to approve draft 3.2 – Jay Anderson, second by Jerry Ramie, passed by unanimous consent.
- m) Action item for Secretary to post ballot comment resolution file, clean version of draft 3.2 and redline of draft 3.2 to iMeet.
- n) Recess and time of final adjournment, approximately 11:32 pm Pacific time.
- o) Next meeting date and location will be September 18-21 in Myrtle Beach.

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
Jörg Blumschein	Siemens	Guest
Austin Wade	SEL	Guest
Claire Patty	PGE	Voting Member
Bill Morse	SEL	Guest
Travis Mooney	SEL	Guest
Lou Garavaglia	G&W Electric	Requested membership
Charles Pestell	Powell	Guest
Adrian Zvarych	Qualus	Guest
Mal Swanson	Iniven	Voting Member
Marilyn Ramirez	Qualus	Guest

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

**IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV
Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time**

<u>Name</u>	<u>Affiliation</u>	<u>Voting Status</u> (voting member, non-voting member, guest)
Mike Dood	SEL	Voting Member
Chris Huntley	SEL	Guest
Roger Whitaker	Self	Guest
Malia Zaman	IEEE-SA	Guest
Jay Anderson	SEL	Voting Member
Tony Bell	Ametek	Guest
Michael Meisinger	S&C Electric Company	Voting Member
Jay Herman	EPRI	Guest
Abdel Hamid	HydroQuebec	Guest
Galina Antonova	Hitachi Energy	Guest
Hani Al-Yousef	Eaton Corporation	Voting Member
Byungtae Jang	KEPCO	Guest
Zitao Wang	S&C Electric Company	Voting Member
Gerald Ramie	ARC Technical Resources	Vice-Chair
Thomas Rudolph	Schneider Electric GmbH	Voting Member

I32: A Survey of Protective System Test Practices

Chair: Andre Uribe

Vice Chair: Will Knapek

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.

1. Working Group did not meet this week.
2. We have received the latest survey results.
 - a. 112 participated
 - b. 81 are qualified surveyors
3. Working Group will meet in September to start developing the report.
4. Next meeting location: Myrtle Beach, SC.
5. Adjournment

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV

Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

I33: Review of Relay Testing Terms

Chair: Scott Cooper

Vice Chair: Hugo Monterrubio

Secretary: Scott Cooper

Output: Report

Established Date: 1/19

Expected Completion Date: 9/23

Draft: 2.0

Assignment: Review the various definitions of relay testing terms and develop a Report with formal definitions in order to help eliminate any confusion.

- a) Officer presiding-Scott Cooper
- b) Officer recording minutes-Scott Cooper
- c) Call to order- 23/05/10 10:40 PDT
- d) Chair's remarks- Current membership, Review of project status, way forward.
- e) Results of call for quorum: 4/4 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. Vote complete, 5 disapprovals
- i) Action items
 - a. Resolve comments and update the report
 - b. Conduct internal review of document
 - c. Resubmit to I-subcommittee for next action
- j) Items reported out of executive session (if such sessions have occurred)-NA
- k) Recesses and time of final adjournment (if different from our published face-to-face meeting agenda) 23/05/10 11:30 CDT
- l) Next meeting date and location, September 2023 or WebEx as required

I36: PC37.90.2 Standard for Relays, Relay Systems, and Control Devices used for Protection and Control of Electric Power Apparatus – Radiated Electromagnetic Interference Withstand Capability Requirements and Tests

Chair: Chase Lockhart

Vice Chair: Mat Garver

Output: Standard

Established Date: September 2017

Expected Completion Date: May 2023

Draft: 5.0

Assignment: Revision of - Standard for Relays, Relay Systems, and Control Devices used for Protection and Control of Electric Power Apparatus – Radiated Electromagnetic Interference Withstand Capability Requirements and Tests

The Working Group (WG) did not meet this time because the work is wrapping up. Comment resolution has been completed, will recirculate for approval.

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

**IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV
Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time**

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

Chair: Marilyn Ramirez

Vice Chair: Bill Morse

Output: Standard

Established Date: 2018

Expected Completion Date: 2024

Draft: 2.0

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

Meeting Participants:

<u>Name</u>	<u>Affiliation</u>	<u>Voting Status</u>
Marilyn Ramirez	Qualus	Voting Member
Todd Martin	Basler Electric	Voting Member
Bill Morse	SEL	Voting Member
Travis Mooney	SEL	Voting Member
Roger Whittaker	Self	Guest
April Underwood	SCS	Voting Member
Peiman Dadkhah	NUGrid	Guest
Hani Al-Yousef	Eaton	Voting Member
Abel Gonzalez	Megger	Guest
Jim Niemira	S&C	Guest
Mat Garver	Hubbell	Guest

- Officer presiding: Marilyn Ramirez
- Officer recording minutes: Marilyn Ramirez/April Underwood
- Call to order, approximately 1:05 pm PDT
- General welcome
- The meeting had 6 members and 5 guests in attendance. Quorum was met.
 - January 2023 Meeting Minutes were reviewed and approved.
 - Motion: Bill Morse; Second: Todd Martin
- Patent slides were shown, no claims were made. Copyright and Participant behavior slides were shown, no claims were made.
- PAR Extension through 2024.

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

- Discussions:
 - Analysis of the definitions was discussed.
- Action Items:
 - Revisions will be included on a new copy of the standard draft and definitions section will be updated.
 - Team will review draft and make a motion to go to ballot via email.
- Final adjournment, approximately 1:45 pm Pacific Daylight Time.
 - Motion: Bill Morse; Second: Todd Martin

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. IEEE Std C37.92-2023 has been published as of 25 April 2023. The working group awards are planned for the September 2023 PSRC meeting in Myrtle Beach, SC.

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: 6

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

Task Force I40 met on Wednesday, May 10 in a double session beginning at 8:am Pacific daylight time. This was primarily an in person meeting. There were 12 people in attendance with 11 of those being in person. A quorum was achieved with 7 of 13 voting members in attendance.

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

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

The agenda was reviewed. The motion was made by Jerry Ramie to approve the agenda. The motion was seconded by Travis Mooney. Agenda was approved.

Minutes from the January 2023 meeting were reviewed. The motion was made Jerry Ramie to approve minutes. The motion was seconded by Travis Mooney. Meeting minutes were approved.

Section 5.4 was reviewed

Concerns were raised that wording was not clear about when validity tests needed to be done. Wording could result in the reader thinking they are required to perform test more often than they are. Wording was changed to improve clarity.

Concerns were raised that feed through test name is not consistent with the purpose of the test. This was changed Measurement System Validation test. **This will need to be changed throughout the document.**

Section 7 was reviewed

A few typos were changed.

Coupling/isolation was changed to coupling/decoupling. **The remainder of document will need to be search and have this changed anywhere it exists.**

The remaining annexes were reviewed with no changes. This completed the review of the standard. The standard will be worked on to get all formatting cleaned up so it is ready for balloting by the working group. Travis Mooney has volunteered to help with that clean up.

This completed the meeting. Travis Mooney made the motion to adjourn the meeting. Hani Al-Yousef 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

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

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

1. Officer presiding

The presiding officer at this meeting was Chair Steve Turner.

2. Officer recording minutes

Chair Steve Turner recorded the minutes in this document.

3. Call to order

Chair Turner called the meeting to order.

4. Chair's remarks

5. The standard is ready and has been submitted to RevCom.

6. Results of call for quorum

The quorum check established that a quorum was present.

7. Approval of Agenda (motion and second)

It was moved and seconded to approve the agenda.

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

It was moved and seconded to approve the previous minutes.

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

The standard is ready and has been submitted to RevCom.

10. Action items

Chair is working on processing awards for the working group members.

11. Items reported out of executive session (if such sessions have occurred)

There was no executive session.

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

Chair Turner adjourned the meeting on time.

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

The next meeting will be in September 2023 at the PSRCC meeting in Charleston, SC.

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

**IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV
Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time**

Attended:

Steve Turner

Travis Mooney

Maria Marilyn Ramirez

Bill Morse

Hani Al-Yousef

Todd Martin

Lou Garavaglia

Malia Zaman

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 PT on Monday May 8th, 2023 in a Hybrid format.

- a) Introductions
- b) The chair, vice-chair, and secretary introduced themselves. The meeting opened with 8 members and 12 in-person guests. Several connectivity issues took place since meeting resources requested were not provided by the venue.
- c) Quorum verification: A quorum was not obtained since less than 12 members attended the meeting (under 50%). The January, May, and September meeting minutes could not be approved without a quorum.
- d) Discussions regarding the need of more contributors for developing content took place with the goal of bringing awareness and hopefully gaining more support towards the development of the report. Also, it was discussed that some authors have left their current positions which means that they will be unable to continue supporting the development of the report.
 - a. Conversations on the possibility of adding more models for voltage of the simulations took place (concerns about the model maybe being too

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

conservative), but it was decided that we should focus on existing methods and not use this document for new ways of testing or performing simulations given the restrictions on the scope and time to complete the report.

- b. If there is enough interest another working group can be created for analyzing other models and providing this information to the industry. (evaluating accuracy of current models and refining them)
- e) Review sessions have been scheduled in a bi-weekly format. Chair asked for people who wanted to become part of these sessions to make wg's leadership aware to include them on the group.

The meeting was adjourned at 18:39 ET.

Our next meeting will be in Myrtle Beach, SC in September of 2023 (time TBD). A room for 30 people will be needed.

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

Chair: Andre Uribe

Vice Chair: William Knapek

Output: Report

Established: 01/2020

Expected Completion Date: 05/2023

Draft: Ver 6.0

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

1. Introductions
2. We had 7 members attend the meeting
3. Review of January 2023 meeting minutes
 - a) *We reviewed the report and determined that the report needs some modification so that it addresses the type of skill sets needed for a protection engineer or technician to properly perform work in a digital substation vs addressing the various skill sets needed per individual function i.e., protection, networking, commissioning, etc...*
 - 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 September's meeting.*
4. Members determined that we are at final draft.
5. Members agreed to review report for final edits or comments.
6. Members agreed to a virtual meeting for July 16th to continue finalizing the report.
7. Members goal is to submit our final paper prior to September's meeting.
8. Next meeting location: Myrtle Beach, SC
9. Adjournment

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

**IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV
Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time**

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 9:20 AM Pacific
- Check for quorum – YES!

Display the following:

- IEEE Patent Policy: Call for Patents: <https://development.standards.ieee.org/myproject/Public/mytools/mob/slide-set.pdf>
 - IEEE Copyright Policy: <https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/copyright-policy-WG-meetings.potx>
 - Show Respect For Others
- Approve past minutes 1st Jim 2nd Bracy

Proposed Agenda

- Review-Approve Last Meeting Notes (4/26/2023) - Passed
- Approve Proposed Agenda 1st Don 2nd Bracy
- Revisit discussion on testing Inductive Impedance on grounding conductors with varying radii. Plans for actual lab or field testing. Germane to this Report, or perhaps a separate study?
- Continue the Report review starting @ Section 4.7
- @ 5 minute mark – Round Table & **Action Items**
- Motion to Adjourn at 10:27 AM Pacific

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

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, 5:00 PM PST
- b) Chair's greeting & remarks, a total of 8 participants joined the hybrid (in-person/Webex).
- c) Agenda was presented and reviewed
- d) Patent slides were reviewed. The attendees did not present any patents requiring further action.
- e) Copyright slides were presented. No comments from the attendees.
- f) As quorum was achieved, Brian Mugalian made a motion to accept the January 2023 meeting minutes and Sudarshan seconded the motion.

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

Brian Mugalian will review Section 4 –Assignment pending

Jim O'brien will review section 5.1 through 5.4 – Follow up needed

Bruce Magruder will review section 5.5 & 5.6 - Assignment pending

Sudarshan Byreddy & Bruce will review section 5.7 - Assignment pending

Shivam Prabhakar will review section 6 – Will send end of this week

Jim Niemira will review section 7 - Received

Sudarshan Byreddy will write a new section 5.7.3.5 - Pending

Jim Niemira will review Annex A - Received

Brian Mugalian will review Annex B - Assignment pending

Bruce Magruder will review Annex C- Assignment pending

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 Sudarshan.

<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
Shivam Prabhakar	Siemens	Voting Member
David Ellis	PSE&G	New Voting member
Don Lukach	Ameren	Guest

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

**IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV
Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time**

<u>Name</u>	<u>Affiliation</u>	<u>Voting Status</u> (voting members)
Matt Black	Sargent & Lundy	Guest/ Terminology Liaison
Ryan Luberg	Duke Energy	Guest
Mark McChesney	Oncor	Guest

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: Nicholas Kraemer

Minutes recorded by: Amir Makki

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 5 of 9 members and 7 guests. A motion was made approve the January 2023 minutes. Minutes were approved unanimously.

Main discussions and proceedings:

- Results of the online vote on proposed title, scope, and part were presented. 7/9 members cast ballots, with 7/7 votes being in favor.
- Discussion regarding the relationship between I47 and S17/S0 and their work on SBOMs was had. S17s work is related, but is unlikely to be directly relevant or overlapping for I47's current work.
- Discussion regarding I47 and its relation to the S0 subcommittee's scope was had. WG noted that in order to discuss desired security provisions, co-operation with the PSCCC S0 subcommittee was desirable
- WG voted to request PSCCC joint sponsorship. 5/5 members voted in favor.
- A member of S0 volunteered to join the I47 leadership as a co-chair or vice co-char, as appropriate.

A motion was made to adjourn 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 Agenda

**IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV
Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time**

I48: Revision to IEEE C37.103: Guide for Differential and Polarizing Relay Circuit Testing and Polarizing Relay Circuit Testing

Chair: Mohit Sharma

Vice Chair: Gary Kobet

Secretary: Open

Output: IEEE Guide

Established Date: January 2023

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

I-48 met for the second time as a working group in-person with 5 attendees in-person on Tuesday, May 9th, 2023, at 1:00 PM Pacific Time.

Mohit started the meeting with the review of patent and copyright policies. There was no potential claim raised. The published 2015 guide is now on the latest IEEE SA template. Since we had new attendees and no review work done, we reviewed Section 1. There were discussions on polishing the introduction to provide better clarification on the content published in the guide.

We added 3 new members.

Action Items –

- Mohit to share the guide on iMeet Central for members to review and contribute.
- Assignments –

Review Introduction to provide better clarification on the intent of the guide– All members.

Review Section 4 & 5 and suggest improvements – Jim Niemira, Joshua Hughes

Review Section 6 & 7 and suggest improvements – Zitao Wang, Mohit Sharma

Review Section 8 & 9 and suggest improvements – Swagata Das, Zach Zaitz

Review Section 10 & 11 and suggest improvements – Angelo Tempone, Ryan McDaniel

Review Section 12 & 13 and suggest improvements – Mohit Sharma, Ryan McDaniel

Review Section 14 and suggest improvements – Swagata Das

The meeting was adjourned at 2:05 PM Pacific Time.

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

**IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV
Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time**

I49: Roadmap for Developing New or Updating Existing IEEE Standards to Address Issues of Centralized Protection and Control (CPC) Systems

Chair: Craig Preuss

Co-chair: Brian Mugalian

Secretary: Melvin Moncey Joseph

Output: Report

Established Date: January 2023

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

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

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

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

Transformers Used for Protective Relaying Purposes

d. No other new business.

12. Liaison Reports

a. Transformers Committee—Will Knapek.

The Transformer Committee met the week of March 19th, 2023, in Milwaukee, WI.

Instrument Transformer Sub Committee Agenda

Meeting: March 22, 2023

- Short conversation about moving some/all of C57.13.5 into C57.13
- Status of C57.13 Standards
- WG Report – IEC-IEEE 63253-5713-8
- TF Instrument Transformer Accuracy
- WG to revise C57.13
- Status report – C57.13.9
- New Business
- Presentation by Kurt Kaineder on Low Power/Electronic CT/VT sensors. This will focus on what IEC is currently doing. This may lead into a conversation on how IEEE can address the topic and role the ITSC would take on in such a development.
- Next meeting – Kansas City, Missouri, USA, Fall 2023
- Adjournment

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

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

IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV

Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time

C57.13.9	Standard for Power-line Carrier Coupling Capacitors and Coupling Capacitor Voltage Transformers	PAR extended Balloting now
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13. Other announcements?

- a. PSRC I26 “Mathematical Models for Current, Voltage, and Capacitively Coupled Voltage Transformers” will go to SC ballot soon.
- b. None.

2. Motion to Adjourn, by Kevin Donahoe, Second by Andre Uribe
Motion carried unanimously.
Adjourn time: 4:02 PM Pacific Time

Next meeting will be Myrtle Beach, SC, September 2023.

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

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

**IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV
Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time**

Reference Material:

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

L##: Title of Working Group

Chair: ???

Vice Chair: ???

Secretary: ???

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

Established Date: ??? (Month, Year)

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

Draft: ???

Assignment: ???

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

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

Additional notes:

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

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

**IN-PERSON MEETING (with hybrid support for members) – Las Vegas, NV
Wednesday May 10, 2023, 2:45 PM to 4:05 PM Pacific Time**

Proposal for New TF or WG

Date:

Definition of the Problem

What is happening?

What should be happening?

Proposal for Task Force

Submitted by:

J Subcommittee Meeting Minutes, May, 2023, Las Vegas, NV

J SC met Wednesday May 10, 2023 at 1:15 PM PDT with 24 out of 33 members and 7 guests, reaching quorum.

J24 meeting minutes were not available as part of the J SC meeting minutes. The completed minutes will be approved via email.

Working Group Reports:

J15: Investigation of the Criteria for the Transfer of Motor Buses

Chair: Wayne Hartmann

Secretary / Vice Chair: Doug Weisz

Established 2015 (1/15)

Output: Report (Draft 13)

Status: 25th Meeting (5-9-23)

Assignment:

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

WG Report

1. The Working Group (WG) met only briefly on May 9, 2023, as there were no open action items or topics left to review with the WG.
 - Gary Kobet chaired the WG
2. Attendance: Total 14 (9 members and 5 guests).
3. Quorum was not achieved so minutes from prior 3 meetings were not approved.
4. Gary volunteered to convert the report into the required IEEE format and plans to have it completed by the end of this week, 5-13-23.
5. Gary will then forward the formatted report to Wayne and Doug for transmittal to the WG.
6. The report will then be forwarded to the WG for review and approval, and it will be requested to review it by mid-June 2023 giving the WG about a month to review it.
7. If no response is received from any particular WG member, it will be interpreted as "Approved as is".
8. The WG comments will then be incorporated into report by Chair or VC (unless require discussion) so that the report can then be immediately routed to the Sub Committee (SC) for review.

J Subcommittee Meeting Minutes, May, 2023, Las Vegas, NV

9. We can request the SC to review and provide comments by end of August 2023 so that we can go over those SC comments at the Sept 2023 meeting in Myrtle Beach.
10. The 2nd J15 meeting today was cancelled.
11. The meeting was adjourned.

Next Meeting:

Single session, projector, room for 30 people. The WG also requests no conflict with all J particularly J16 (C37.101), J17 (C37.102) and J20 (Sync)

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

Chair: Ryan Carlson

Vice Chair: Doug Weisz

Established: 2016

Output: Guide

Status: 17th Meeting (5-9-23)

PAR Expiration: Dec 2024

Assignment: Revise C37.101 Guide for Generator Ground Protection

WG Report

The WG met with 16 total participants (11 members, 5 guests) where 15 were in-person and 1 was remote. Quorum was achieved as 11 out of the 19 voting members were present. As quorum was achieved, Ryan asked if someone would like to make a motion to accept the Jan 2023 meeting minutes. Dale made a motion to accept those meeting minutes and Bracy seconded that motion.

Ryan reviewed the patent slides required for IEEE PAR WGs and he mentioned that the PAR ends 12-31-2024 so we should decide by 5/24 if want to request a PAR extension.

Ryan mentioned he will post the latest working draft copy of C37.101 in the "Drafts in Progress" folder on imeetcentral this week. If any members need access to this workspace, please let us know and we will ensure you get access.

The new, overhauled C37.101 format change was briefly reviewed again and the TOC of the latest draft for the guide was displayed.

Bracy and Joshua volunteered to review the Annexes.

For the review of the guide itself, over 300 comments were received from Bracy, Gary, Manish, Ritwik, Ryan, Sudarshan, Todd, and Will where Ryan has worked on 75 of them already.

The working group then proceeded to discuss several of the received comments in more depth:

- Ritwik added some keywords where some discussion ensued on if there should be a comma between intermittent and arcing i.e. intermittent, arcing. Doug mentioned that it is commonly displayed as intermittent arcing where Nader stated that arcing is by its nature intermittent, so it is unnecessary to qualify arcing with intermittent. He also said some intermittent faults could also be other than arcing type so the comma should stay and the WG agreed.

J Subcommittee Meeting Minutes, May, 2023, Las Vegas, NV

- Ritwik had commented that the title of the guide could be changed from “Draft Guide for Generator Ground Protection” to “Draft Guide for Generator Ground Fault Protection”. Doug stated that maybe to be more correct it should be Stator Ground Fault Protection. There was some discussion on where Field Ground Fault Protection is described as it is not in this guide, but Manish stated it is somewhat covered in C37.102.
- There was discussion on if core balance or window type CTs should be used as both are presently used in the guide and maybe we should be consistent. C37.2 liaison Mel Swanson will be consulted on this question.
- Ritwik had commented that C37.102 is in the Normative references and it is not referenced anywhere in the guide. Ryan will look for a spot in the guide to reference C37.102 so it can be left as is.
- There was some discussion on the hybrid ground protection scheme in the definitions section. It was agreed upon to simplify it to just talk about low impedance grounding is used initially, then after it trips it reverts to high impedance grounding.
- Table 1 was discussed in some detail where it was decided to add resonant grounding and delete the medium resistance grounding and change the low resistance ground fault current range from 400A-1200A to 200A-1200A. Also, the table will be re-ordered to match how the subsequent sections are laid out in the guide. Ryan suggested changing one of the column title's from “Fault current” To “Ground Fault current”. We discussed the comment under the ungrounded generator where the prior version of the guide had this blank, but we had agreed to add a comment.

The working group plans to have scheduling monthly virtual meetings prior to the September meeting.

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

Next Meeting:

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

J17: 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: 22nd meeting, May 8, 2023 (In Person with Virtual Option)

Expected completion date: -

PAR Expiration: Dec 2024

Assignment: Revise C37.102 Guide for AC Generator Protection

WG Report

WG met on May 8, 2023 virtually via Teams and in person for a double session with attendance recorded from a total of 19 members and 19 guests. Quorum (16) had not met at checking. The Jan 2023 minutes will be approved via email.

J Subcommittee Meeting Minutes, May, 2023, Las Vegas, NV

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

The WG, via the CRGs, worked to resolve all comments received during the initial SA ballot, and the changes were implemented in draft 7.3. Some additional comments were received from WG review of this draft. These are in the process of being resolved via WG discussions and emails. A set of these comments were discussed in this meeting, as follows.

- Comment I-129 – Figure 67 - Agreed to keeping the figure as shown and stating the alarm could be set lower than the limiter.
- Comment I-166, I-167, I-168, I-169 – Agreed to retitle 5.4 to Inadvertent Energization or Inadvertent Breaker Closing.
- Comment I-68 – 4.3.2.7 Overall Differential Protection - Consensus seemed to be there is actually no dependability problem for phase fault at location F2. Mike and Ritwik will work to rephrase as needed.
- Comment I-153 – 4.8.2 Exciter phase unbalance - Agreed to retain first sentence of 2nd para to say “phase unbalance relay”, and strike the phase mentioning symmetrical component function in digital relay.
- Comment I-150 – 4.7.2 - Agreed to change title of this subclause to Generator breaker close failure protection per discussion between Ritwik and Mike to satisfy their comments
- Comment I-115 – Unbalanced currents – Rotor Harmonic Heating. Dale and Mike will propose some updated wording to satisfy Mike’s comments.
- Comment by Hasnain Ashrafi on Fig 95 – Agreed to move 87O CT to exclude the Gen, and add redundant 87G.
- Comment by Will English in 4.3.2.5.3 – review if reader would understand the term “threshold set inside the generator” – Ritwik will help review.
- Comment by Will English on equation (5) in 4.5.1.3.1 Impedance Scheme to consider adding a variable that will have a value of 0.95 or 1 to remove the uncertainty from the definition of kVLL. WG agreed.
- Comment by Chair – Annex A Table A.1 showing third harmonic values are not from the machine being used. The table also does not represent the complete data typically needed at all operating conditions. After discussion WG agreed it was best to remove the table and just keep the guidance in the preceding para.

Comments made on Annex A are still being worked on.

Once these comments are resolved, draft 7.4 will be issued for WG to review one more time. If there are no additional comments, a WG motion will be made to move to recirculation ballot using a redline of the initial SA ballot draft.

Motion from WG via email will be made to approve the Jan minutes, as well as some editorial changes in 1.1 Scope and 1.2 Purpose. The latter will also require Subcommittee motion.

Retain present CRGs to help address and disposition any recirculation ballot comments.

J Subcommittee Meeting Minutes, May, 2023, Las Vegas, NV

Next Meeting:

Request a single session with space for 40 people and a computer projector. The WG also requests no conflict with all J.

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 May 9, 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

Attendance:

Total 15 (4 members and 11 guests)

Overview:

- No comments provided on September 2022 meeting minutes
- Chair discussed the limitations of the existing EMT models for Type 3 wind turbines.
 - Satisfactory results were not obtained from the generic models available in EMT software.
 - Only the PLL can be tuned. No other parameters could be tuned. PLL tuning had no impact on machine performance in the simulations run by Romulo Bainy.
 - Vendors can provide black box models, but they are typically tuned to a given system where the IBR will be installed.
- Yanfeng Gong knows a professor at USF who has used generic models to recreate the Texas SSCI events. Yanfeng can make an introduction between J18 WG and the researchers at USF.
- The chair discussed the possibility that SSCI is due to characteristics of the DFIG itself and not the DFIG controls.
- Yanfeng Gong stated that Type 3 and Type 4 turbines have exhibited SSCI behavior, but it's not clear which is the cause.
- Romulo: We were able to produce SSCI using the commercially available models, but couldn't do any tuning, changing of PI loops, etc. to change the response in a material way
- J18's research has shown that the grid side converter does not contribute to SSCI, but other than this, we haven't been able to identify the aspect of the wind turbine / control system that is the key contributor.
- Yanfeng Gong stated that when he was with AEP, they experienced an SSCI event, but were unable to get an accurate model from the manufacturer.
- Extensive discussion of the limitations of the generic models available in EMT software

J Subcommittee Meeting Minutes, May, 2023, Las Vegas, NV

- Black box models are typically being used right now.
- A coordinated effort between PSRC, utilities, and entities such as ERCOT could be beneficial for getting better models and supporting documentation from the turbine vendors as well as for obtaining high-resolution data for model validation.
 - Bracey Nesbit offered to request SSCI event data from ERCOT that J18 could use for model validation.
 - Paul Harris from Pacificorp offered to reach out to vendors for additional details on the wind farm control systems and to work toward obtaining event data.
 - 8-10kHz sampling rate, 2 seconds pre-fault, 1 second during disturbance
- J18 report will provide an academic level treatment of SSCI along with some basic modelling techniques, but will not provide a definitive summary of the aspects of IBRs that contribute to SSCI, nor will it provide a summary of all available mitigation techniques. Additional research is required to develop these conclusions.
 - A Task Force should be created to identify next steps.

In the J Subcommittee meeting Jason Eruneo made the motion, seconded by Mike Thompson to disband the J18 working group. The motion was approved with 19 in favor and 5 opposed.

J20: Report on Practices for Generator Synchronizing Systems

CHAIR: Jason Eruneo

VICE-CHAIR: Ritwik Chowdhury

Output: Report (Draft 8.5)

Established: January 2019

Status: 12th WG Meeting, Las Vegas, NV May 10, 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. Steve Conrad motioned to approve minutes and Ryan Carlson seconded. Meeting minutes unanimously approved.

- **Mike** and **Gary** volunteered to review the appendix drafted by Steven Mueller.

We subsequently started comment resolution of WG Ballot comments and resolved many of them. Action items were made for the following comments.

- Comment #93: **Mike** will revise Section 3.3.2, including the figure.
- Comment #100: **Gary** to add a paragraph to Section 5.3.2 describing solutions to the disadvantage of the scheme.
- Comment #117 + #118: **Jason** to work with **Bracy** to address comment.

Next meeting is planned to be on June 9, 2023. **Mike** will ping his colleague for the synchronizing video. The meeting was adjourned at 10:28 AM Pacific Time.

J Subcommittee Meeting Minutes, May, 2023, Las Vegas, NV

Next meeting:

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

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 (12th meeting May 10, 2023 Las Vegas, NV)

WG report

The WG met with 6 members, and quorum was not met. 15 attendees.

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

Januarys' meeting minutes will be approved via email.

Discussed plan of attack and general consensus is that we will proceed with writing and presentation assignments, and continue to coordinate with J22 activities for any major changes to the guide.

Assignments (writing and PPT) due August 31st:

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

Clarification that assignment includes both written document and presentation slides.

Synchronous motor data sheets reviewed:

- 1 – 30,000 hp
- 2 – 14,000 hp

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

Motion to adjourn (Zeeky, 2nd Finney)

J Subcommittee Meeting Minutes, May, 2023, Las Vegas, NV

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.
- Gary K to obtain PSRC template for slides.
- Derrick to send out assignments, word document template, power point template.
- Derrick and Zeeky to distribute motor data sheets.

Next meeting:

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

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

Chair: Zeeky Bukhala

Vice Chair: Jason Buneo

Secretary: --

Output: Guide

Draft: -

Established Date: May 2021

Status: WG Meeting 9

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 ninth meeting on Wednesday, May 10th, 2023 in a double session with 13 members and 11 guests in attendance.

- I. Welcome/Introduction
 - a. The Chair kicked off the first session at 8:00am PDT and welcomed members and guests, this was followed by introductions.
- II. Quorum check
 - a. 13 of 27 members were in attendance. Quorum was not met.
- III. Approval of Meeting Minutes. Quorum not having been met, Chair will seek approval of January 2023 minutes by email.
- IV. Patent Slides.
 - a. Patent Slides were shared.
 - b. Chair provided an opportunity for attendees to identify patent claims or applications which they may be aware of that may be essential for the use of that standard and none was identified.
- V. Assignments
 - a. Jason Eruneo comments. Reviewed comments Sections 5.2.1-5.2.8 (6th paragraph).
Key points:
 - i. 5.2.1.1 Insulation rating classes (A, B, F, H). It was suggested to maybe add temperature ratings to avoid having to go to another standard. Andy Kunze will provide a table to add the temperature ranges for the insulation classes.
 - ii. 5.2.1.2 Temperature Rise.

J Subcommittee Meeting Minutes, May, 2023, Las Vegas, NV

- There was a question on what the temperature rise was referring to. IEEE Std 112 was referenced. Is the temperatures referring to stator winding temperatures for pickup and alarms.
- Changed overtemperature devices to “protection”
- iii. 5.2.2 Motor Characteristics. Added “torque” to first sentence. Second sentence is too long. Jason will review and make changes to the first paragraph.
- iv. 5.2.4 National Electrical Code
 - Discussion on whether the year needs to be referenced when referring to the NEC. Will remove the year to keep it more generic. Adopted rest of editorial changes.
 - “The adoption of the NEC... added “included in this guide.” at the end of that paragraph.
 - Andy Kunze will check on the specific NFPA Articles that are referenced in the latest version. Article 430 is the one in question for the latest version.
 - Andy is also verifying other NEC and OSHA wording for this section.
 - Discussion on whether “should” from the NFPA standard can be added since it would be quoted directly and not a recommendation from the guide. Agreed to retain if NEC specifically states the requirement.
- v. 5.2.6 Unusual Ambient Conditions
 - Discussion on editorial comments.
 - Discussion on how to derate motor for high ambient temperature. Discussion on how to do this with respect to synchronous and induction motors. Discussion if there is a formula for derating based on ambient temperature. Andy Kunze to find a relevant reference.
 - Andy Kunze will check on other guides for derating motors based on Ambient temperature.
- vi. 5.2.7 High and Low Voltage and Frequency. Bracy Nesbit will work on a sentence to close out the thought of the first paragraph in this section.
- vii. 5.2.8 Locked rotor failure to accelerate
 - Discussion on how to reword the motor controller interrupting the locked rotor current. Derrick Haas made suggestion. “Switching device” was substituted in the document.
 - Derrick Haas will look at first paragraph in 5.2.8.
 - Second paragraph, deleting “rated slip speed”
 - Changed “locked rotor stage” to “acceleration stage”
 - Changed sentence to, “The rotor resistance decreases to a lower value as the rotor approaches full load speed.”
 - Paragraph after Figure 10, wording changed to “considers” regarding locked rotor thermal limit requirement in design.
 - Derrick Haas will look up IEEE std 620-1996 to see if this is the latest standard and still applies to the time current accelerating curve be plotted on the same graph as the thermal limit curves for at least 80% and 100% voltage.
 - Changed wording at that end of paragraph 3 to, “acceleration time will be increased.” Andy Kunze will take a look at the tail end of that paragraph and see if he can reword some of it.
 - Dale Finney will review reference Ramsaur (B130) in paragraph 5. Performance of Overcurrent relays on cold load restoration, PEA Relay Committee Proceedings, 1952

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- Paragraph 6, kept editorial changes except in the sentence, “When the rotor accelerates...” where “frequency” was removed 5.2.6
- b. Shivam Prabhakar had volunteered to help Tom Beckwith with updating Figure 44. Chair will facilitate their collaboration.
- c. Reviewed status of assignments. Summary of assignment status is available in iMeetCentral. Pending assignments:
 - i. 3. Definitions – OPEN
 - ii. 4.3.6.1 – Bracy Nesbit
 - iii. 5.1-5.5 – Derrick Haas
 - iv. 5.6 – Nabil El Halabi
 - v. 5.8 – Nabil El Halabi
 - vi. 5.9 – Hasnain Ashrafi
 - vii. 6.4 – JC Theron
 - viii. 7 – Nabil El Halabi
 - ix. 11 – Zeeky Bukhala
- VI. Next Steps.
 - a. Chair reminded working group to complete assignments and upload output to iMeetCentral.
 - b. Next meetings
 - i. Early July. Virtual meeting.
 - ii. Mid-September. Meet at the September PSRC meeting, Myrtle Beach, September 18th – 21st, 2023.
- VII. Adjournment. Meeting Adjourned at 10:25am PDT.

Next meeting:

Double session with accommodations for 30 people and a projector is requested. Also request no conflict with J15, J16, J17, J20 J21, JTF28 and K31. 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: (5-9-23)

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.

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- 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

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

1. Use generator condition-based monitoring to detect potential problems before an actual fault develops and schedule maintenance.
Bracy Nesbit – LCRA #submitted
Dale Finney – SEL (Bracy to send Dale his writing assignment)
Have draft available for review at the next working group meeting.
2. Describe and develop guidelines for online condition monitoring of large synchronous generators, including salient-pole rotors as well as cylindrical rotors.
Bracey Nesbit – LCRA # submitted
Rob Messel – Siemens Energy
Have draft available for review at the next working group meeting.
3. Provide information on online condition monitoring techniques as well as recommending thresholds to trigger alarms and initiate remedial or compensating action.
Steve Turner – APS > Provide draft for review at next working group meeting
Jay Mearns – PGE > **Outstanding**
Abel Gonzales – Megger > Provide draft for review at next working group meeting
4. Demonstrate how to use specific the protection functions to monitor generators.
Steve Turner – APS > Provide draft for review at next working group meeting
Steve Turner & Doug Weisz > 64S commissioning and setting; outstanding
Doug Weisz – Hubbell > Load Profiling/Commissioning/Injection; outstanding
Laurel Brandt – TVA > 64F load profiling; outstanding
Sungsoo Kim – TRC > Provide draft for review at next working group meeting
JC Theron – GE > **Outstanding**
5. Describe mechanisms of degradation and applicable monitoring devices.
Ellery Blood – SEL, Inc. > Provide draft for review at next working group meeting
6. Pilot projects to explore this technology.
Steve Turner – APS > Provide draft for review at next working group meeting
Dale Finney – SEL, Inc. > **Outstanding**
7. Actual fault develops and schedule maintenance.
Bracy Nesbit – LCRA & Dale Finney – SEL, Inc.
Outstanding.
8. Results from a study on partial discharge conducted on 107 machines.
Jay Mearns - PGE > **Outstanding**

Next meeting:

Single session with accommodations for 20 people is requested.

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J24: Report on Synchronous Generator Disturbance Recording

Chair: Shane Haveron

Vice Chair: JC Theron

Secretary: open

Output: Report

Established Date: September, 2021

Expected Completion Date: January, 2026

Draft: -

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

WG Report

The working group met on 05/09/2023 at 5:00pm PDT with 3 people in attendance. 3 out of 5 voting members present, achieving quorum.

Proposed agenda and minutes from January 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.

The Chair reviewed updates to the outline report which includes details about DFR basics, signals being measured, data types (high resolution/short duration, medium resolution/medium duration, low resolution, long duration), and recording modes (triggered, continuous). The need for good time synchronization was discussed. The structure of the report will continue to be developed and when sections have been identified, volunteers will be invited to contribute. Will English's PRC-002 contribution will be included.

Derrick Haas 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. The group feels that the monitoring required to detect SSO could be included in the report. J23 condition monitoring may also be of interest.

The Vice Chair started writing sections addressing generation measurements and oscillations and will incorporate into the outline report in the ShareFile.

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 10 people is requested.

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

J25: Report on Synchronous Condenser Protection

Chair: Jason Eruneo

Vice Chair: Dale Finney

Secretary: open

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Output: Report

Established Date: September 23, 2021

Status: 5th WG Meeting, Las Vegas, NV May 9, 2023

Expected Completion Date: January, 2025

Draft: 2.2

- **Assignment:** Develop a report for Synchronous Condenser Protection. This report will discuss all aspects related to the protection of synchronous condensers. This includes design, settings, and protection schemes for synchronous condensers. Specifically, identify functions that apply to a synchronous condenser and refer to IEEE C37.102 for functions that align with the synchronous generator guidance.

WG Report

WG met with 25 attendees. There was a check for quorum and a quorum was established.

Gary K. motioned and Steve Conrad seconded to approve the January meeting minutes.

The WG discussed whether a generator relay or a motor relay should be specified for a synchronous condenser.

- Pratap expressed that synchronous condensers may have different start up processes depending on the size of the unit. The WG concluded that for a hydro machine or combustion turbine that may operate in synchronous condenser mode that a generator relay should be specified. For a dedicated synchronous condenser, the entity should consult with the manufacturer to determine if there are any special considerations during startup that would require the utilization of a motor relay for the synchronous condenser.
- **Action Item: Derrick Haas** will write a section on considerations for the application of a motor or generator relay.

The WG discussed ambient temperature compensation for field winding overcurrent protection.

- A WG member expressed that the field winding overcurrent protection may be shifted dynamically based on the ambient air compensation. Bracy doesn't think that dynamic rotor heating needs to be covered in this report. Ritwik C suggests to be an addition to a future revision of C37.102.

The WG discussed whether the positive offset loss of field scheme provides any value for a synchronous condenser.

- The positive offset scheme is set to coordinate with the machines manual steady state stability limit and the generator capability curve. A synchronous condenser does not require the same level of coordination since its operating region is severely reduced relative to a synchronous generator. The WG decided that the negative offset scheme should be recommended for a synchronous condenser.

The WG discussed how a loss of field and out of step event would look on the impedance plane for a synchronous condenser.

- Normann Fischers study results show that a synchronous condenser cannot slip a pole for either one of these events. Normann has already provided an analysis using the swing equation.
- WG discussed the need for a definition of pole slip. **Action Item: Gary K. & Ritwik C.(review)** will provide a writeup for the report.

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- For a fault on the transmission system, the apparent impedance from the generators perspective will oscillate in the first and forth quadrant of the R-X diagram far away from the synchronous condenser terminal. This signifies that there is instability in the transmission system and the synchronous condenser is not slipping a pole. The oscillations are a result of the stored-up inertia within the rotor flowing out of the machine; this results in the exportation and importation of megawatts from the machine.
- The WG discussed the definition and characteristic of a pole slip for a generator. Some language will be crafted up to describe the impedance loci characteristic of a pole slip and how the energy within the rotor can impact this characteristic.
- The WG has expressed concerns about the loss of field results from Normann's study. The results show that the synchronous condenser will remain at synchronous speed after a loss of field event. We would expect the machine to operate with some slip as a quasi induction motor during this event.
- We have not heard back from the generator manufacturers as to why they believe a synchronous condenser can slip a pole and why they believe out of step protection is needed. Normann has provided equations and study results that support the position that a synchronous condenser cannot slip a pole. He has provided a very strong case to the WG for this position.
- WG discussed whether we should include protection requirements during startup. TVA has a scheme for startup.
- **Action Item: Jason Eruneo** will provide a write-up recommending the negative offset scheme for dedicated synchronous condenser.
- We will have a virtual WG session before September to allow everyone the opportunity to ask Normann questions on his analysis and results.

Next meeting:

Single session. With room for 30 and a projector. Request no conflict with D29, 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: 4th WG Meeting May 9, 2023

Expected Completion Date:

Draft: -

Assignment: Write a summary paper of the J13 report, Modeling of Generator Controls for Coordinating Generator Relays.

WG Report

The working group met in one session on Tuesday 9th, with 13 participants in person, out of them, 11 members and 2 guests. A quorum was achieved.

Minutes of the January 10th, 2023, meeting in Jacksonville were approved.

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Juan Gers presented an updated version of the power point presentation that was discussed in the last meeting. The file gave details on the content of the summary paper. The word draft of the summary paper was presented afterwards. Juan Gers made emphasis in the fact that the overall content was taken from the original paper and summarized, keeping the most relevant information. Even though the discussion was not thorough for time limitations, several points were discussed and modified accordingly. Some paragraphs were eliminated considering that the paper does not require detailed treatment of each section.

Mike Basler indicated that the models for AVR, PSS and Governor used are simple but still illustrative. They should be left in the summary paper although it will be made clear that newer and more capable models are available on the market. It was agreed to remove references to any manufacturer to avoid conflicts. It was suggested to change the formats of some figures if colors are not available by the IEEE Editors.

In a future project beyond the work of this group, the use of those models can be proposed as well as the introduction of real time modeling. The possibility of undertaking this possible work will be addressed once this summary paper is finished.

As the next step, Juan Gers will update and distribute a draft of the word report with the changes approved in the meeting. The working group will review the draft and submit comments by the end of June with the objective of having a final draft for the September 2023 meeting. The plan is to complete the work and have the paper ready to be sent to the J Subcommittee, before the end of the year.

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: 3rd Meeting May 9, 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: 11 - 4 members and 7 guest

- 1) Discussed IEEE Patent/Antitrust/Copyright Policies & IEEE Code of Ethics. Discussed this is a summary paper and not a standard; however, we intend to follow all IEEE Policies.
- 2) Check for Quorum – no 4/10 members (we will send out Jan minutes for approval)
- 3) Reviewed Sept 2022 minutes. No comments or changes.

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Motion to approve minutes – Doug Weisz, second – Steve Conrad

- 4) There are two assignments that were not completed; however, we expect to have those finished by mid-June.
- 5) We discussed in order to submit an abstract for the Texas A&M Conference by September, we will need to have virtual meetings throughout the summer. The first meeting will be scheduled for mid to late June.
- 6) Discussed narrative sections that reviewed C37.106 Annex section may be able to be summarized. This will be further discussed at the next virtual meeting.
- 7) The accumulator alarm & tripping narratives were discussed whether they should be included in the paper. This will be further discussed at the next virtual meeting.
- 8) Figure-3 graph resolution and purpose was discussed. This will be revisited after all the paper elements are assembled.
- 9) Motion to Adjourn – Doug Weisz, second Zeeky Bakhala

Next meeting:

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

JTF28: Prepare J6, J14 Papers for Publication

Chair: Zeeky Bukhala

Vice Chair: Dale Finney

Established Date: May 11, 2022

Status: Task Force 2nd Meeting May 9, 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 second meeting on Tuesday, May 9th, 2023, with 7 members in attendance.

- I. Welcome / Introductions
 - a) The Chair kicked off the meeting at 2:25pm PST and welcomed attendees to the task force's second meeting followed by introductions.
 - b) Chair had received a couple of requests for clarification on the task force assignment and provided further clarification on the assignment. The two documents being reviewed were original reports that borrowed from previously published IEEE documents. They are not revisions of the original documents.
- II. Approval of Meeting Minutes. Minutes will be circulated for approval.
- III. J6 (Protection issues Related to Pumped Storage Hydro (PSH) Units) Update
 - a) Dale reminded attendees that the original 1975 paper was a transaction paper and that the original J6 assignment was to write a transaction paper. The submitted transaction paper was rejected by the IEEE and the assignment was revised to develop a report.
 - b) J6 developed a conference paper from the draft report. The conference paper had page limitations and was a condensed version of the draft report. The paper was

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published in the Proceedings of the 2017 70th Annual Conference for Protective Relay Engineers (CPRE) and is available in IEEE Xplore.

- c) It was agreed that the task force continue with its assignment to revise the draft report.
- d) Reviewed ballot comments
 - i. Dale Finney circulated the edited report to task force members for ballot on April 12th, 2023 and had requested vote/comments be returned by May 5th. Two ballots have been received as of this meeting.
 - ii. Reviewed Gary Kobet's comments. Comments were accepted and will be incorporated.
 - iii. Dale shared that Will English' comments were mostly editorial. Will had suggested reviewing the list of authors from the 2017 paper given the task force activities. Task force agreed to retain the list of previous (2017) authors.
- e) Next Steps
 - i. May 30th, 2023 – Dale will complete edits and recirculate the report for balloting. Balloting body will be task force members and original authors.
 - ii. June 30th, 2023 – Ballots due to the Chair. No response will be interpreted as a Yes vote.
 - iii. Late July 2023 – Resolve balloting body comments at a virtual meeting to be scheduled.
 - iv. August 30th, 2023 – Submit edited report to Subcommittee for approval.
 - v. Mid-September 2023 – Resolve subcommittee comments at the September meeting.
- IV. J14 (Plant Protection Issues Associated with Black Starting of Generators) Update
 - a) Chair is preparing package for Technical Writer
 - b) Next steps
 - i. May 26th, 2023 – Assign editing task to Technical Writer
 - ii. July 31st, 2023 – Distribute edited document to Task Force and original authors for approval
 - iii. August 31st, 2023– Ballots due to the Chair
 - iv. Mid-September 2023 – Resolve balloting body comments at September meeting
 - v. October 31st – Submit edited paper to Subcommittee for approval
 - vi. November 2023 – Resolve Subcommittee comments at a virtual meeting to be scheduled.
- V. Adjourn
 - a) September 18th-21st – Next meeting at Myrtle Beach, SC
 - b) Meeting adjourned at 2:50pm.

Next meeting:

Single session. With room for 15 and a projector. Request no conflict with J15, J16, J17, J20, J21, J22 and K31.

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Liaison Reports:

Electric Machinery Committee – M. Yalla – C50.12 Chapter 8 on losses and efficiency tests is being revised. There will be no changes to the section on negative sequence.

Industry Applications Society (IAS) / Industrial & Commercial Power Systems (I&CPS) – D. Haas – Nothing to report.

Nuclear 1E WG – P Kumar – IEEE 741 has a PAR request to add an informative annex with guidance on how to protect class-1E loads from the effects of bad power quality (voltage unbalance, harmonics, etc.). They also plan to address previous ballot comments that were deferred for future consideration and plan to utilize a lot of the language in the IAEA Guide on open-phase fault protection as well as the paper from PSRC WG K11 (K11-8.70-Open Phase Detection Nuclear).

Old Business:

None.

New Business:

J SC Scope – A J SC member suggested adding protection of IBRs to the J SC scope. After some discussion and in the interest of completing the meeting on time, the topic was tabled for future discussion.

MemberPlanet – Attendees were encouraged to create their profile in memberplanet in order to continue participating in PES meetings.

Adjournment:

Motion to adjourn was made by Jason Eruneo and seconded by Dale Finney. Meeting was adjourned at 2:35 PM PDT.

K Substation Protection Subcommittee Meeting Notes, May 10, 2023, 2:45 – 4:05 PST – Las Vegas, NV

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**
- **17 members and 35 guests were in attendance.**
- **Check for quorum (17 out of 29 members, need 15 for quorum), quorum was made**
- **Approval of agenda (Steve Conrad motioned, Sebastian seconded, approved unanimously)**
- **Approval of previous meeting minutes (Jeff Barsch motioned, Don Lukach seconded, approved unanimously)**
- **Advisory Committee items of interest**
 - PSRC and PSCC 240+ attendees with 13 first time attendees
 - May 2024 meeting, confirmed in Buffalo, NY.
 - New O&P coming, Main Committee will vote on final O&P at September Meeting
 - Looking for main committee presentation in September 2023 meeting.
 - Member Planet web service still going to be the member database. Please make sure to create a provide in MemberPlanet.
 - PAR-WG chairs, Vice Chairs, please update profile to select an interest in your working group.
 - Please provide meeting minutes to Brandon by May19th. Please use template to allow for easier incorporation into the subcommittee minutes.
 - Two members of K have been removed from the K subcommittee roster. Pat Carroll has retired and Luis Polanco has not been able to attend recent meetings due to other commitments.

Working Group Reports:

K12: PC37.431.20 IEEE Guide for Protecting Transmission Static Shunt Compensators**Chair: Satish Samineni****Vice Chair: Tapan Manna****Secretary: -****Output: Guide****Established Date: 2013****Expected Completion Date: 2023****Draft: 27**

Assignment: To work jointly with Substations WG I9 to write a guide for protecting transmission static shunt 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 had a meeting on Tuesday, May 9th, 2023. K12 had 2 members and 4 guests present. Quorum was not met. January meeting minutes will be approved through email.

Martin Best won't be able to serve as vice-chair due to personal commitments. Tapan Manna will serve as the new vice-chair for this group.

Provided an update from WG I9 meeting from last week.

- Addressed several reference comments in sections 6.8.1, 6.8.2, 6.9.1, 7.4.3
- Went through MEC checklist.
- Voted to move the standard to balloting.

Tapan recommended removing year information from the normative references.

Next few months we will work closely with WG I9 to resolve balloting questions through web meetings.

K25: PC37.99 IEEE Guide for the Protection of Shunt Capacitor Banks**Chair: Rick Gamble****Vice Chair: Mat Garver****Secretary: Brandon Lewey****Output: Guide****Established Date: January 2019****Expected Completion Date: 2023****Draft: 1.6****Assignment:** Revise and Update C37.99, IEEE Guide for the Protection of Shunt Capacitors**Formalities:**

- The WG met on 05/09/2023
- Officer presiding – Rick Gamble
- The meeting was called to order by the Chair
- Introductions were made
- The meeting was attended by 21 members and 11 guests
- Quorum was met
- May 2023 Agenda was approved
- Meeting Minutes from September 2022 & January 2023 were reviewed and approved:
- Chair reviewed the Patent, Copyright, and Participation Behavior Code of Ethics slides
- WG Adjourn

Action Items:

- Chair to request PAR extension in Sept. 2023 meeting
- Secretary to submit author of analytical paper LOA
- WG to review Section 10 and determine revisions required to reflect correct IEEE Standards
- Writing assignments in Section 8 & 9 were made along with reviewing/revising Tables and Figures

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 (26 participants and 13 voting members). Reached quorum (Total 19 working group members). Minutes were shown from January 10 and March 1 meetings and approved motion by Rafael Garcia and second by Robin Byun.
2. Copyright, participant behavior and patent slides were briefly shown and discussed during the meeting.
3. Ballot closed successfully on February 19. All ballot comments were collected. 8 CRG meetings have looked over more than 75% of total 324 comments. Some of the comments and opinions of CRG group proposal was discussed during the meeting. No question or comment on the comment resolution procedure.
4. Discussion of definition. Presented by Ilia opinion of CRG and proposal based upon discussion with SA on this topic. Dean Miller supported removing oil and liquid- immersed definition, as these are mentioned already in other standards. No objections from others to remove if definitions already discussed in other standards and IEEE dictionary. TBD in CRG this proposal.
5. Discussion for the inrush current. Steve and David agree with Mike Thomson. TBD
6. Discussion about neutral reactor. Adjusted definition based upon feedback. Discuss this in CRG and for next steps. TBD
7. Acronyms addition shown.
8. Figure 5 shown proposed by Gary Kobet. Mukesh proposed to change CLR to “Current Limiting Reactor”. “Dashed” discuss as optional connection.
9. Figures 6,7 and 8 change “Courtesy”.
10. Settings for REF and DIF discussed briefly. May require further discussion during comments resolution.
11. Briefly discussed proposal from Dean Miller on comments I-4 and I-5 on loss of colling. (Section 6.1.4.6).
12. David Caverly briefly discussed the protection elements table for dry type settings depending on arrangement. This new table is planned to be added after discussion and approval in WG.
13. Motion to close – Mukesh 6.10 PM

K27: C37.95 IEEE Guide for Protective Relaying of Utility-Consumer Interconnections**Chair: Paul Elkin****Vice Chair: Hillmon Ladner****Secretary: NA****Output: Guide****Established Date: January 2020****Expected Completion Date: December 2024****Draft: 1 , April 7th 2023****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 –
 - <https://mentor.ieee.org/myproject/Public/mytools/mob/slideset.pdf>
3. Quorum : 7/21, no quorum.
4. Approve Agenda
5. Approve Minutes from January Meeting and March Web Meeting
6. Follow up on Assignments Received
7. Discuss Assignments:
 - Gopal Gajjar
 - Section 4 review
 - IBR comments addition for section 7.1
 - Paul Elkin
 - Finalize contribution by Dean Miller on Section 4.3.11. WG already discussed, Paul Elkin to finalize wording.
 - Steve Conrad
 - Clarification on Section 9.3.3 referencing figure 20. Use of partial differential.
 - Hillmon and Paul
 - Continue guide clean-up (should, consumer, etc.)
8. Continue Guide Editing
 - Pink comments in the tracking spreadsheet have been incorporated into section 6.2.5. Discuss with WG.
 - Discuss if WG would like to pursue orange comments for section 8.4.3. This section has already seen considerable improvement, should a discussion on 81, 27 and 59 elements be added?
 - Move to comments highlighted green in our tracking spreadsheet for this meeting.
9. Next Steps
 - Figure update reviews.
 - Reference updates.
 - Final Editorial review by WG.
 - 1-2 interim web meetings to finalize the guide.
10. Adjourn

Notes:

- The WG kicked off the meeting by reviewing Participant Behavior slides and the Patent Slides.
 - No patent claims were issued by members or guests in attendance.
- Call for quorum: 7/21 member present. No quorum.
- Motion to Approve Agenda: Ted Warren, Second Steve Conrad. None opposed.
- Meeting minutes will be approved through email.
 - The working group discussed possible additions to Section 7 on IBR generation and possible needs in the document. This discussion was initiated by a review of Gopal Gajjar's assignment, which prompted great discussion extending most of the meeting.

- It would be good to include a list of special requirements specific to IBR in addition to those already covered for traditional generation.
- It will be especially helpful for consumers or their agents to understand issues surrounding IBR ahead of time for proper project planning.
- Issues to understand:
 - Fault current contributions are not the same and the consumer may require manufacturer to provide additional data.
 - Limited fault current contribution with no 3Io and low 3I2.
 - Behavior for external faults and possible ride through needs. These IBR sources can start to be significant for large industrial customers. Some may be in net metering programs.
 - What special studies may need to be included:
 - EMPT, stability, etc
- The WG is debating whether the new additions would fit better in sections 7.1 or 7.2. It may be useful to start with an appendix and move the material to the body of the document.
- Several sources could be used to create the list:
 - IEEE P2800
 - Utility Interconnection Requirements – Some of these are public. Ted Warren will provide an example.
- Motion to Adjourn: Brandon Davies, Second: Ted Warren. None opposed.

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

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

With 4 voting members out of 10 voting members the Quorum was not reached, and we were not able to approve the January 2023 minutes of the meeting.

We worked through the comments and revisions of Draft 0 based on new PES format is now available; we incremented to Draft 1 as we started working in the meeting.

This led to an interesting discussion around bus differential used for backup feeder trip.

Another discussion and the use of retrip for distribution feeders.

All the comments and editions were reviewed till the end of Section 2.4. During the review, it was noted that parts of the report refer to microprocessor-based relays as an emerging technology rather current industry trend. Adi agreed to check the Bus Guide for consistent naming of Section 2.4.

Draft 0 is already available on PSRC sharefile, Draft 1 will be added. The chair will need to perform some sharing function on the folder so it can be accessed by others.

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: 1.8****Summary:**

- 14 of 19 Voting Members were in attendance - Quorum was achieved
- 31 total attendees. One attendee has volunteered to join the WG and assist with a writing assignment
- Approval of April web meeting minutes was completed via email
- Meeting room request for 30 attendees. Request to avoid conflict with B3, WG J25, WG C26 and WG C50

Details:

- Agenda was presented and reviewed – A motion to approve the agenda was made by Don Ware and seconded by Adi Mulawarman. No comments or discussion was made and the motion passed.
- Patent Slides were presented, no patents were identified
- Copyright and Attendee Ethics slides were presented and reviewed
- Writing slide guide slide was presented
- PAR Purpose and Scope were reviewed
- Vahid presented the overview of the status of section reviewed by WG members and edits captured within the current draft (version 1.8). Latest version is posted on iMeet in macro and non-macro versions.
- Bibliography section 61850 references were discussed. Vahid shared an option to reference a link to the full series of 61850 standards on the IEC website rather than providing references to each section individually. The working group discussed that references that are not cited in the body of the document should be removed and all items that are specifically referenced within the guide should remain.
- Section 6.11 rewrite on breaker condition monitoring schemes such as low SF6 tripping was reviewed at a high level.
- The use of “50BF” in figures 2 and 20 was discussed. Attendees agreed that 50BF in section 3.2 (Acronyms and Abbreviations) is defined as breaker failure current detector. The group suggested that the box with “50BF” could be removed from both figures considering some sensing methods used as part of BFP are not current detector based. The group discussed that some additional discussion in the text of 5.2 would help describe the intent of figure 2. Satish Samineni took an action item to review and update clause 5.2 with additional discussion within a month
- The output of subgroup reviewing comments and edits Section 6.15 (Generator BFP) was discussed.
- Figure 26 terminal markers (dots) of draft 1.8 were discussed as their placement seemed inconsistent and needs to be cleaned up. The location of CT for Generator BFP is already described in text Figure 26 is already described in text. Figure 25 is intended to graphically show the location. Mike Thompson commented it would be a good idea to show CT on the left side (neutral side) of the generator and note that this CT should not be used for generator BFP. A suggestion was made maybe remove the terminal designations. Comment was made removing the termination is OK as long as the CT could be clearly identified is associated with which piece of equipment, i.e. breaker, step-up transformer, etc.
- Vahid asked Jason Eruneo to go over clause 6.15 and related subclause. Let Vahid and Brandon know if Jason’s original comments have been addressed.
- WG members discussed it is a good idea to have web meetings to continue. Adi Mulawarman commented it is good idea to have web meetings. We will plan to have a web meeting in late June, a poll will be sent to members to select a date and time that works for most.
- Adi Mulawarman motioned to adjourn the meeting and Brandon Davies seconded. The meeting adjourned at 9:10AM PST.

Action Items:

- Satish Samineni to add more context to section 5.2 on breaker failure sensing methods describing when each method can be used and how it is used. This writing assignment is requested to be completed by June 12 (within 1 month) so it can be discussed on the June Web meeting.
- WG members review Bibliography section pertaining to the references for IEC 61850 and be ready to discuss at next meeting
- Jason Eruneo review clause 6.15 to verify his original comments have been satisfactory addressed before the late June Web meeting to prepare for WG discussions.

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 report for transient withstand of capacitors is being discussed

Old Business

None

New Business

Sebastian Billaut – One of their engineers followed the methodology for ungrounded bus protection shown in C37.230 Clause 8.3, and found that additional guidance may be needed for consideration of shunt capacitance and size of damping resistor associated with the PT. The concern is that this type of error may result in under sizing the PTs.

After subcommittee discussion on this topic Mike Thompson made a motion to create a task force to determine if the K sub would like to create a PAR to create a corrigendum for clarity in bus guide regarding ungrounded bus protection. Sebastian Billaut seconded. The motioned passed unanimously. Task force KTF-32 will meet in September with Sebastian Billaut as task force chair.

Satish Samineni questioned if a separate guide should be created to specifically discuss the protection of filter banks. This is currently covered in C37.99 but filter banks have a lot of unique considerations so suggested that a separate guide may be warranted.

Satish Samineni made a motion to create a task force exploring the need of creating a separate guide for protection of filter banks. Pratap Mysore seconded. Motion passed unanimously. Task force KTF-33 will meet in September with Satish Samineni as task force chair.

Items of General Interest

Alla Deronja shared an interesting Bus protection misoperation due to multiple CT grounds on a percent restrained differential relay. The operation happened during commissioning.

Ted Warren shared a change in philosophy at his utility to start using reclosing on transformer high side circuit switchers at distribution substations rather than going direct to lockout condition. This scheme uses differential and low side overcurrent to determine that the fault is outside of the transformer but still inside the transformer differential zone (faults within the transformer reclosing is blocked). Ted commented that they had their first successful reclose event on this scheme which greatly reduced the outage duration.

Adjourn

Paul Elkin motion to adjourn; Vahid Madani seconded.