

**POWER SYSTEM RELAYING COMMITTEE
OF THE IEEE POWER and ENERGY SOCIETY
MINUTES OF THE MEETING
September 13, 2012
Portland, OR
Final-Approved**

I. Call to order / Introductions Bob Pettigrew

Chairman Bob Pettigrew called the meeting to order at 8:00 am. After introductions, a quorum was verified and Main Committee Attendance sheet was routed.

II. Approval of Minutes & Financial Report Mike McDonald

The minutes of the New Orleans May 2012 meeting were found not complete and will be up for approval at the January 2013 meeting.

Burns & McDonnell, Portland General Electric, POWER Engineers, Pike Energy Solutions, HDR Inc. and BPA were recognized for their coffee break support.

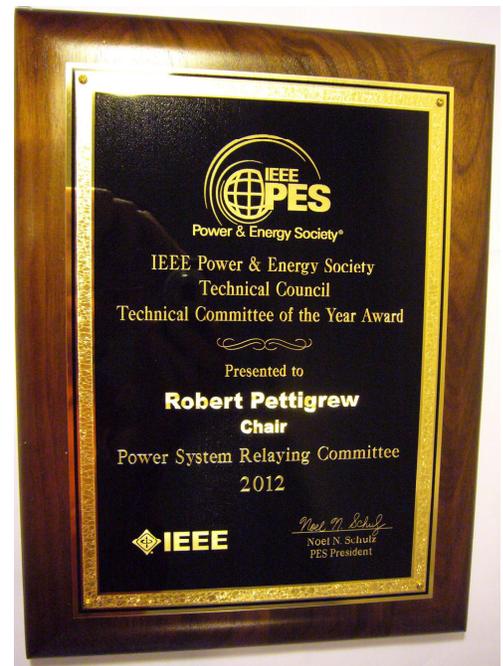
Chairman's Report Bob Pettigrew

The September 2012 meeting is my final meeting as Chairman of the PSRC. I want to thank all of the volunteers that help make the PSRC a great success. The Entity Annual Report, on the Chairman's Corner of the PSRC Web site, has an amazing list of PSRC accomplishments for 2011. This is a tribute to all of the hard work done by the PSRC attendees to complete assignments and publish informative papers and standards for the industry. Thanks to all of you who have made this job easier with all of your hard work.

I also need to thank Charlie Henville and Miriam Sanders for their assistance as I learned the officer's responsibilities over the past 6 years. I could not have succeeded in this position without their valuable assistance.

Thanks to everyone's hard work the PSRC was awarded the "Technical Committee of the Year" Award from PES Technical Council. Thanks to all for your hard work that distinguished PSRC as the best of the PES technical committees. Special thanks to Mal Swanson who compiled the 2011 Entity Annual Report that described all of the PSRC accomplishments in 2011 and was the basis for the PSRC award.

I would also like to thank Roger Hedding and Mike McDonald for their hard work over the past several years in assisting me in the operations of the PSRC. I feel the PSRC is in good hands with their leadership in the coming years. I finally want to announce that the incoming Secretary of PSRC will be Pratap Mysore. Thanks to Pratap for accepting this position and I am sure all will help him in this new and difficult job.



III. Reports of Interest

A. Technical Paper Coordinator's Report – Roger Hedding

2012 General Meeting, July 22- 27, 2012 San Diego

48 papers were submitted for review to the PSRC for the 2012 general meeting. 8 were rejected. We had 3 paper sessions and 1 poster session.

In addition we held a Topics of Interest from the PSRC Session . The following papers were presented:

- a) Protective relay performance during stressed system conditions (Pratap Mysore)
- b) Undervoltage load shedding (Miroslav Begovic)
- c) New synchrophasor standard developments (Farnoosh Rahmatian)
- d) Protection Redundancy Considerations (Solveig Ward)
- e) Fault current contributions from wind farms (Dean Miller)

2013 General Meeting, July 21-25, 2013 Vancouver, BC, CA

The call for papers for this meeting went out recently. Papers can be submitted from November 1 – 30, 2012. One of the 5 Super Sessions at this conference is Innovations and Advancements in Protection and control for the Evolving power system. I'll be contacting you all as potential reviewers as the November date approaches. Papers for this conference will have a page limit of 5 pages.

Future Meetings

Jan. 2013	JTCM Memphis Marriott Downtown, Memphis, TN
May 12-16, 2013	Tremont Plaza Hotel, Baltimore, MD
Sept. 8 -12, 2013	Hotel Albuquerque at Old Town Albuquerque, NM
Jan. 2014	JTCM
May 11-15, 2014	Hyatt at Pier 66, Fort Lauderdale, FL
Sept. 8–11, 2014	Pfister Hotel, Milwaukee, WI

Futures places and dates are under development.

B. CIGRE B5 Activities Report - Adamiak

No report submitted

C. IAS Power System Protection Committee - Mozina

No report submitted

D. IEC Report - Eric Udren

TC 95. Measuring relays

TC 95 drives IEC measuring relay standards – electrical and physical environment type testing, design, safety, and functional behavior. Technical work is carried out by Maintenance Teams (MTs) and by Working Groups.

The recently emerging suite of functional standards is developed by MT4. The Convenor of MT4 is Dr. Murty Yalla. MT4 has already published functional standards 60255-151 (Overcurrent relays) and 60255-127 (Over and undervoltage relays). Their current projects are 60255-121 (Functional standard for distance relays), 60255-149 (Thermal electrical relays), and 60255-187-1 (Functional standard for differential relays – generator and transformer differential). Current status of functional standards:

- 60255-121 – Distance relays - A Committee Draft for Voting (CDV) has been circulated to national committees, and the US vote is due in mid-December. This has been reviewed and heavily commented by PSRC WG D21 and issues have all been resolved in prior comment cycles.

- 60255-149 – Thermal electrical relays - A Committee Draft for Voting (CDV) is in circulation; voting advice and comments are due by October 7.
- 60255-187-1 – Functional requirements for biased (percentage) differential relays - differential protection of generators, motors, transformers and reactors. MT 4 has a preliminary draft which has not yet appeared as an official CD.

Other current TC 95 standards:

- 60255-27 Edition 2 CDV – *Product Safety for Relays* - Voting advice and document comments due to Eric December 7. The draft, along with comments of other national committees on the last CD, are available for review.
- 60255-24 COMTRADE standard - After behind-the scenes negotiations between certain European national committee voters and the PSRC WG, the IEEE draft was revised and passed; a corresponding IEC voting draft (CDV) has been successfully balloted by national committees. So IEEE and IEC versions of COMTRADE remain separate documents that are, through back-channel efforts, technically identical.
- 60255-118-1 Synchrophasor measurement standard – a version identical to C37.118.1-2011 had been issued by TC 95 as CD and had brought only a few minor comments from the national committees who voted. IEEE SA is now negotiating with IEC TC 95 to see if IEC will issue 118.1 as dual logo in its current state, and recheck for need to revise periodically thereafter. We do not yet have the outcome of that discussion.

Any PSRC attendee interested in reviewing and commenting on circulated documents should contact Eric Udren for a copy.

The next TC 95 meeting will take place during the IEC meeting in Beijing, November 12-16. The TC 95 meeting itself takes place on November 13.

TC 57, Power systems management and associated information exchange

See TC 57 Liaison Report at the end of Subcommittee H minutes for many exciting developments in IEC 61850.

Notably, IEC TC 57 has adopted IEEE C37.94, N Times 64 Kilobit Per Second Optical Fiber Interfaces Between Teleprotection and Multiplexer Equipment, as a dual-logo standard listed as IEC 61850-85-1.

E. Standard Coordinators Report – Phil Winston

Standards Activities since the September, 2011 Meeting

The status of standards activities that have taken place since the May 2012, meeting of the PSRC are as follows:

RevCom Activity:

Standards Reaffirmed

None

Standards Approved

C37.104	IEEE Guide for Automatic Reclosing of Circuit Breakers for AC Distribution and Transmission Lines_
C37.90.1	Standard Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus

Standards submitted for approval

C37.96	Guide for AC Motor Protection
C37.99	Guide for the Protection of Shunt Capacitor Banks
C37.102	Guide for AC Generator Protection _

Standards due for 10 year review

None

Ballot Activity:

Standards/Projects currently in Balloting (Sponsor Ballot, Comment Resolution, Recirculation)

C37.111	Standard for Common Format for Transient Data Exchange (COMTRADE) for Power Systems
PC37.236	Guide for Power System Protective Relay Applications over Digital Communication Channels
PC37.242	Guide for Synchronization, Calibration, Testing, and Installation of Phasor Measurement Units (PMU) for Power System Protection and Control
PC37.244	Guide for Phasor Data Concentrator Requirements for Power System Protection, Control, and Monitoring

NesCom Activity:

PARS applied for or submitted for approval

None

PARS approved

PC37.103	Revision of Guide for Differential and Polarizing Relay Circuit Testing
PC37.245	Guide for the Application of Protective Relaying for Phase Shifting Transformers

PAR Extensions (applied for & approved)

None

Modified PAR approved

PC37.98	Standard for Seismic Qualification Testing of Protective Relays and Auxiliaries for Nuclear Facilities (modification)
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Modified PAR submitted

None

PARs Requested for Withdrawal

None

PARs Administratively Withdrawn

None

PARS expiring at the end of 2012

C37.96	Guide for AC Motor Protection
PC37.98	Standard Seismic Testing of Relays
PC37.99	Guide for the Protection of Shunt Capacitor Banks
C37.111	Standard for Common Format for Transient Data Exchange (COMTRADE) for Power Systems
C37.236	Guide for Power System Protective Relay Applications over Digital Communication Channels

PARS expiring at the end of 2013

C37.95	Guide for Protective Relaying of Utility-Consumer Interconnections
C57.13.3	Guide for Grounding of Instrument Transformer Secondary Circuits and Cases

PAR/Standard Submittal Deadlines & Standards Board Meeting Schedule:

Submittal Deadline	Meeting Date
October 15, 2012	December 4, 2012
January 24, 2013	March 5, 2013
May 03, 2013	June 13, 2013
July 12, 2013	August 22, 2013
October 21, 2013	December 10, 2013

F. C0: DATA ACQUISITION, PROCESSING, AND CONTROL SYSTEMS SUBCOMMITTEE

Chair: C. Preuss

Vice Chair: Vacant

Secretary: Vacant

Working Group Reports (See below)

New Business

- IEEE Central Desktop can be used by working groups working on standards, but does not replace use of 123Signup and Substations Website
- Outcome of 1711 meeting was discussed (see below)
- PSRC standards coordination is required
- 2030.4 PAR was discussed and C0 chair was added to the 2030.4 Central Desktop site to monitor what that working group is doing and inform them on what C0 does
- C0 website needs to be updated by working group chairs
- Future presentations were discussed

C1: IEEE 1686 Standard For Substation IED Cyber Security

Chair: S. Sciacca

Vice Chair: M. LaCroix

Secretary:

Output: Standard

Expected Completion Date:

- A. The document is nearly complete...just two sections to finalize
- B. Eric Thibodeau introduced the concept of adding a feature which requires support for generic remote password management. Eric will write something up to present to the group.
- C. General discussion on the event log circular buffer. It's possible that someone could perform actions such as failed logins to overwrite an action that he wants to be erased. Various scenarios discussed...but each introduces other complications. Problem is less of an issue when IED is connected to a supervisory system. Sam will draft something and call for a teleconference meeting to discuss further.
- D. Sponsor Ballot invitation ends Sept 20. Intent is to move to ballot shortly after. Krista Gluchowski (IEEE) will produce a timeline for completion.
- E. Meeting Adjourned.

C2: IEEE 1613 Standard Environmental and Testing Requirements for Communications Networking Devices in Electric Power Substations

Chair: J. Tengdin

Vice Chair: L. Smith

Secretary:

Output: Standard update

Expected Completion Date:

Did not meet.

C2.1: IEEE 1613.1 Title

Chair: J. Tengdin

Vice Chair: L. Smith

Secretary:

Output: New Standard

Expected Completion Date:

Review PAR Approved June 2012: Joint Sponsor (PES T&D)

Scope: Per title, adds comm via RF and PLC (Note: an extension to IEEE 1613.2009, NOT a revision)

Major Additions – presentation by Jerry Ramie from ARC Technical about closing seven gaps in the IEEE Transient Test Standards while communication is underway

1. Surge - IEC 60255-22-5
2. Conducted Immunity - IEC 60255-22-6
3. Power Frequency Magnetic Field - IEC 61000-4-8
4. Pulsed Magnetic Field - IEC61000-4-9
5. AC Dips/Interrupts - IEC 61000-4-11
6. DC Dips/Interrupts and AC Ripple - IEC 60255-11
7. Power Frequency Immunity - IEC 60255-22-7
8. Additional Candidate - AC on Telecom Circuits

C3: IEEE C37.1 Standard for SCADA and Automation Systems

Chair: C. Preuss

Vice Chair:

Secretary: Vacant

Output: Standard

New business

1. Finally received access to IEEE Definitions database
2. Finally had 123Signup attachment problem fixed
 - a. Sent out copies of 2030
 - b. Sent out copies of C37.1
3. Obtained definitions of DA and DMS from smart distribution working group
4. More on alarm management
5. How does 1613.1 impact C37.1?
6. How should IEDs handle multiple masters and specifically controls (different form of redundancy – both pri/bu always active)?
7. Logging of high speed data and careful use of OPC (DA versus “newer OPC stuff”)
8. USB ruggedness
9. Colors used for graphics on screens
10. Does C37.1 handle RTD and thermocouple performance requirements?
11. Difference between a substation gateway and server?
12. Testing procedures for factory acceptance and site acceptance testing
13. Add better description of serial port requirements

C4: IEEE XXXX Draft Standard for SOE Time Stamping Requirements for Substation IEDs

Joint with PSRC

Chair: M. LaCroix

Vice Chair:

Output: Standard

No PAR yet, but PAR was reviewed at meeting.

C5: IEEE C37.2 Draft Standard for Electrical Power System Device Function Numbers and Contact Designation

Chair: M. Dood

Vice Chair:

Output: Standard update

Reviewed PAR and ideas for changes

1. MU for merging unit or not. Discussion on whether this is RIO or not.
2. SEC for security gateway
3. Device 16 clarification, add in terminal server
4. Additional logical node cross references in Annex D. 61850-5 has a cross-reference, too, and this work is underway to revise/publish it. WG needs to find out what has been done.
5. RIO – clear up what the intent is of “repository” and whether it is required or not will help define whether a merging unit should be considered

C6 Trial Use Standard for a Cryptographic Protocol for Cyber Security of Substation Serial Links (P1711)

Chair: D. Whitehead

Vice-Chair: Andrew Wright

Output: Standard

The C6 working group met to discuss moving from trial use or not.

The agreed upon approach is the following:

1. Submit a new PAR for 1711 to change the name to 1711.2 and title, address PNNL concerns about "hygiene"
2. A new PAR for 1711.3 to include the PNNL work. Should be very similar to work done to establish DNP3 as an IEEE standard. Dave Whitehead will contact Mark Hatfield at PNNL to be chair of this effort.
3. Reserve 1711.1 for a future standard that compares the strengths/weaknesses of 1711.1 and .2.

C7 IEEE 1588 Profile for Power System Applications

Chair: T. Tibbals

Vice Chair: M. Dood

Output: Standard

Established: 2009

See PSRC report.

C8 IEEE 1615 Recommended Practice for Network Communications in Substations

Chair: J. Gould

Vice Chair:

Secretary:

Output: Standard

Established: 2011

Working group met. Discussed adding:

1. Firewall technologies, both hardware and software components
2. Discuss 1711
3. Wireless
4. HSR/PRP
5. IPv6
6. Lemnos
7. Testing and maintenance coverage is only C37.115 reference
8. WG needs to contact PSCC Dan Nordell about overlap with PSCC
9. WG needs to contact T&D about overlap for DA networks
10. AMI also terminates in substations, too
11. Discussed change in title from "in" to "for"
12. Address serial server (as opposed to port server and terminal server)
13. Took volunteers for updating clauses
14. Should look at importing coverage of RS232 and RS485 from C37.1

C9: IEEE 1646 IEEE Standard Communication Delivery Time Performance Requirements for Electric Power Substation Automation

Chair: J. Tengdin

Vice Chair: D. Holstein

Output: Standard

Established: 2009

Expected Completion Date: 2010.

The C9 working group did not meet.

C10: IEEE PC37.240 Standard for Cyber Security Requirements for Substation Automation, Protection and Control Systems

Joint Chair: T. Tibbals

Vice Chair:

Output: Standard joint with PSRC H13

Established: 2008

Expected Completion Date: 12/2012

Met joint with PSRC. See PSRC report.

C11: PC2030.101 IEEE Recommended Practice for the Design and Implementation of Time Synchronization Distribution Systems for Substation Automation

Chair: J. Bougie

Vice Chair:

Output: Standard

Established: 2012

Expected Completion Date:

Reviewed existing scope and purpose and modified scope. PAR will be submitted. Discussed specific requirements of devices: how do I know that my clock is right; how do I know my IED is right?

C12: IEEE 1815 IEEE Standard for Electric Power Systems Communications - Distributed Network Protocol (DNP3)

Joint Chair: L. Smith

Vice Chair: A. West

Output: Standard

Established: 2009

Expected Completion Date: 2012

Scheduled but did not meet.

C13: IEEE C37.115 IEEE Standard Test Method for Use in the Evaluation of Message Communications between Intelligent Electronic Devices in an Integrated Substation Protection, Control, and Data Acquisition System

Joint Chair: J. Tengdin

Vice Chair:

Output: Standard

Established:

Expected Completion Date:.

The C13 working group did not meet.

C14: IEEE P1815.1 Draft Standard for Exchanging Information between networks Implementing IEC 61850 and IEEE Std 1815 (DNP3)

Joint Chair: L. Smith

Vice Chair: R. Farquharson

Output: Standard

Established: 2010

Expected Completion Date: 2012

Continued work with review of comments from ballot.

C15: PC2030.100 Recommended Practice for Implementing IEC 61850 Substation Automation Systems

Joint Chair: R. Liposchak

Vice Chair:

Output: Standard

Established: 2012

Expected Completion Date:

The WG reviewed the present draft.

G. NERC Report – Phil Tatro

1. System Protection and Control Subcommittee (SPCS) Activities

a. Order 754: The NERC Board of Trustees approved the Section 1600 Request for Data or Information on August 16. The data request responds to concerns raised in FERC Order No. 754 related to single-points-of-failure in protection systems. The effective date is September 1, with a staged approach for data submittals over a two-year period. A draft interpretation of TPL-003 and TPL-004, clarifying the extent to which the planning standards require assessment of protection system single-points-of-failure, was posted for comment through July 19. The team is currently considering and responding to comments. An initial ballot is expected in September 2012.

b. Order 758: The SPCS and System Analysis and Modeling Subcommittee (SAMS) have completed a report on considerations for maintenance and testing of autoreclosing relays. In response to FERC Order No. 758, this report recommends that specific autoreclosing applications that may impact bulk power system reliability should be included in a future revision of PRC-005. The report also recommends for these applications, the minimum maintenance activities and maximum intervals should be similar to those proposed in PRC-005-2 for protective relays of similar design. The report will be presented to the NERC Planning Committee (PC) on September 18. Upon PC approval, the report will be submitted to the NERC Standards Committee to support revisions to PRC-005.

c. Special Protection Systems (SPS): The SPCS and SAMS continue work on an assessment of the definition of SPS, SPS-related protection and control (PRC) standards, and existing regional practices related to SPS. A strawman definition will be presented to the PC on September 18. A complete report will be presented in December. The report will serve as a reference document for a standard drafting team that will be assigned to review the definition and standards.

2. Standards Activities

a. Protection System Maintenance and Testing: A successive ballot for PRC-005-2 concluded on August 27, 2012. The successive ballot achieved quorum of 78.11% and weighted segment approval of 80.31%. The team will meet to assess stakeholder comments. If no substantive changes are proposed the standard will proceed to recirculation ballot in October.

b. Protection System Misoperations: Draft 2 of PRC-004-3 was posted for a 45-day formal comment and initial ballot period that ended September 7, 2012. The initial ballot achieved quorum of 86.71% and weighted segment approval of 37.68%. The drafting team is developing responses to stakeholder comments from the posting.

c. System Protection Coordination: The drafting team is responding to stakeholder comments from the posting and initial ballot of PRC-027-1 that ended July 5, 2012. The standard achieved a quorum of 84.24% and a weighted segment approval of 23.82%.

d. Generator Relay Loadability: The Generator Relay Loadability standard drafting team is working on its first draft of PRC-025-1 – Generator Relay Loadability. The team is working to have this new standard posted for the first time for formal stakeholder comment in September 2012.

IV. ADVISORY COMMITTEE REPORTS

Chair: Bob Pettigrew

Vice Chair: Roger Hedding

B1: Awards and Technical Paper Recognition

Chair: Oscar Bolado

Vice Chair: Solveig Ward

The B1 Working Group met on September 11th, 2012 in Portland, OR with 6 of its 7 members present. Membership for the working group consists on the Vice-chairs of the PSRC subcommittees.

The minutes of the last meeting were reviewed and approved. We started the meeting with two exciting announcements.

Last July, the IEEE Board of Directors awarded Dr. Mohindar Sachdev with the 2013 Charles Proteus Steinmetz Award "For contributions to and leadership in the development of guides, recommended practices, and standards for power system protection."

In August, the IEEE Standards Association Awards Committee and the IEEE-SA Board of Governors voted unanimously to award the IEEE-SA Emerging Technology Award to Pierre Martin. The Awards banquet will be held at the Hyatt Regency Hotel in New Brunswick, NJ on Sunday, 2 December beginning at 5PM.

Congratulations!

In the meeting, the working group selected candidates for the PSRC and PES working group and prize paper awards. Voting will follow. PES nominations are due in November.

The group reviewed the upcoming recognitions to be requested. We have 12 recognitions pending and 5 more will be requested.

It was proposed recognition for long time members after they stop their involvement with PSRC activities. If these members are to become Honorary Members, PSRC will recognize the Honorary Member with a plaque. For those retiring from PSRC activities with at least 25 year of service (Silver Service Award) and not promoted to Honorary Members, a framed certificate of appreciation will be extended recognizing the numbers of years served.

Awards presented at the September PSRC Main Committee Meeting:

Certificate of Appreciation to John Gardell – Chair of J1 for the completion of the WG assignment: Adjustable Speed Drive Motor Protection Application and Issues

Gold Service Award – 40 Years – Mohindar Sachdev
Silver Service Award – 26 Years – Phil Winston
Bronze Service Award – 15 Years – Prem Kumar
Bronze Service Award – 15 Years – Dean Miller
Bronze Service Award – 15 Years – Brian Mugallian
Bronze Service Award – 22 Years – Sam Sciacca
Bronze Service Award – 16 Years – Mike Thompson

With no additional business to discuss the meeting was adjourned.

B2: Fellows Awards

Chair: C. Henville

No report.

B3: Membership Committee

Chair: M.J. Swanson

Attendance during the Portland PSRC meeting was 213, which is considered a normal number for us. 18 new attendees were in our Newcomers Orientation meeting on Tuesday.

One retention support letter was written. The appeal was successful.

As a further note, if any attendee needs stronger management support for PSRC participation, we encourage them to let us know.

8 Service Awards were presented.

B4: O & P Manual and WG Training
Chair: J Appleyard: O&P Manual: Did not meet.
Chair: R Hunt: WG Training: No report

B5: Bibliography and Publicity
Chair: T.S. Sidhu
Vice Chair: M. Nagpal
Group did not meet. – is being reviewed for re-organization.

B8: Long Range Planning
Chair: Miriam Sanders
No report.

B9: PSRC Web Site
Chair: Russ Patterson
Group did not meet.

V. Items from the Main Committee meeting:

- A. There were no new Main Committee members announced
- B. There were no new Fellows announced
- C. There were no motions presented for the Main Committee

VI. SUBCOMMITTEE REPORTS

C: SYSTEM PROTECTION SUBCOMMITTEE

Chair: S. Ward
Vice-Chair: J. O'Brien

The C System Protection Subcommittee met on Wednesday, May 12, 2012 in Portland, OR with 23 members and 44 guests in attendance. Quorum was reached.

Minutes of the May 2012 Subcommittee meeting were approved.

8 Working Groups and 2 Task Forces met at this meeting.

PSCE liaison report: Nothing to report.

PSSC liaison report: Report is included in the CTF3 meeting minutes.

OLD BUSINESS

None

NEW BUSINESS

I subcommittee had set up a task force meeting at this PSRC meeting about the Impact of DC Transmission on Protective Relaying. Since that should have been C subcommittee work, the meeting was held with Jim O'Brien presiding. After discussions in the meeting, it was decided that Peter McLaren and Joe Mooney would gather more information to be presented to the task force at the January PSRC meeting. The Task Force will be CTF20 and Peter McLaren will lead the Task Force. The subcommittee approved this approach.

Yi Hu proposed a Task Force for the Commission, Design and Operation of Large Scale SIPS. Motion was made and seconded to create a Task Force to start this work. The SC voted to approve this. CTF21 will be formed with Yi Hu as the chair to begin this work.

Reports from the WG Chairs

C2: Role of Protective Relaying in the Smart Grid

Chair: Alex Apostolov

Vice Chair: Mark Peterson

Output: IEEE Report

Established: January 2010

Expected Completion Date: To Be Determined

Assignment: Identify the functions and data available in Protective Relaying Devices that are used at different functional levels and different applications and can be used within a Smart Grid. Describe the use of interoperable data formats for protection, control, monitoring, recording, and analysis.

Working Group C2, Role of Protective Relaying in the Smart Grid, met on September 12, 2012 at 8:00 am. Individual introductions were made and attendance was taken. 14 members and 15 guests were in attendance.

The meeting began with a review and clarification of the group's assignment. The present draft report was reviewed.

Each section was discussed and members volunteered to review and add material where necessary. A contribution by Alex Apostolov was presented, complementing several sections of the document.

After some discussions it was concluded that after the review of the new draft of the report (to be completed by the end of November 2012), it will be distributed to the members of the working group so it can be finalized during the January 2013 meeting.

It was decided to remove the section on Documentation (considered out of scope of the report). Mark Simon described briefly the status of the H2 report Protective Relay Applications Using Smart Grid Communications.

C4: Guide for Phasor Data Concentrator Requirements for Power System Protection, Control, and Monitoring (PC37.244)

Chair: Galina Antonova

Vice Chair: Vasudev Gharpure

Output: Guide C37.244

Established: January, 2011

Estimated Completion Date: To be determined

Assignment: Develop a guide for performance, functional, and information communication needs of Phasor Data Concentrators for power system protection, control, monitoring, and information management. The Guide will include system needs for PDC applications, configuration, and testing procedures.

Working Group C4 met on Sept 11, 2012 in Portland, OR in a double session with 29 attendees (16 members and 13 guests) in the first session and 18 attendees (13 members and 5 guests). Quorum was achieved in the first session. January 2012 and May 2012 meeting minutes were approved.

After introductions, Working Group Chair presented IEEE Patent Policy slides and asked to bring up any patent issues. None were identified.

Working Group Chair updated the group on project status:

- PC37.244 Sponsor Ballot completed on Aug 6, 2012 (passed)
- Comments resolution is on-going (223 comments in total)

Comments resolution followed. The Chair divided remaining comments into topics. Comments on PDC definition, PDC functions, functional requirements and performance requirements were addressed.

Working Group Chair reminded that the group has regular conference calls on Monday and Friday 10am – 11:15am Pacific time. Next call is on Monday September 17.

C5: Guide for Synchronization, Calibration, Testing, and Installation of Phasor Measurement Units PC37.242

Chair: Farnoosh Rahmatian

Vice Chair: Paul Myrda

Output: Guide C37.242

Established: May, 2010

Estimated Completion Date: June, 2011

Assignment: Develop a Guide for Synchronization, Calibration, Testing, and Installation of Phasor Measurement Units (PMU) for Power System Protection and Control

Scope: The document provides guidance for Synchronization, Calibration, Testing, and Installation of Phasor Measurement Units (PMU) applied in Power System Protection and Control. The following are addressed in this Guide:

- Considerations for the installation of PMU devices based on application requirements and typical bus configurations
- Techniques focusing on the overall accuracy and availability of the time synchronization system
- Test and calibration procedures for phasor measurement units (PMUs) for laboratory and field applications
- Communication testing for connecting PMUs to other devices including Phasor Data Concentrators (PDC)

Purpose: This guide is intended to be used by power system protection professionals for PMU installation and covers the requirements for synchronization of field devices and connection to other devices including Phasor Data Concentrators (PDC).

The Working Group met on September 10, 2012 in a single session. The session was chaired by Farnoosh Rahmatian. There were participation from 9 members, 2 corresponding members, and more than 12 guests. We had quorum of members (9/17).

The IEEE-SA Patent Slides were presented – there were no comments from the participants.

All participants introduced themselves.

The minutes of the May 2012 meeting were reviewed and approved with a quorum of the members. (Motion for approval – J. Hackett, seconded by V. Madani).

WG Chair provided an update of activities since last PSRC meeting in May 2012. Summary of the activities includes:

- Held several teleconferences to resolve the comments received during the Sponsor Ballot (closed April 9, 2012).
 - All comments have been resolved (over 500 Comments)
- Many comments were truncated through the IEEE-SA tools; the WG has been in contact with most commenters and has updated the master comments list. This issue has also been noted to the IEEE-SA staff members.
- The WG is ready for recirculation

The recirculation process will start shortly – after review by IEEE-SA staff

- Need to separate the comments received outside of the IEEE-SA system (they will be loaded to MyProject system separately.)

- There may be edits required to the resolution wording after review by IEEE-SA staff.
- The recirculation is expected to last 10 days

C13: Undervoltage Load Shedding Protection

Chair: Miroslav Begovic

Vice Chair: Shinichi Imai

Output: IEEE Report

Established: September 2005

Expected Completion Date: May 2012

The Working Group did not meet.

Working Group is planning a meeting in January 2013.

C14: Use of Time Synchronized Measurements in Protective Relaying Applications

Chair: Jim O'Brien

Vice Chair: Alla Deronja

Output: IEEE Report

Established: May 2007

Expected Completion Date: Dec 2012

Assignment: Produce a general report to PSRC Subcommittee C outlining practical protection applications using synchrophasors.

Working group C14 met on September 11, 2012, in Portland, OR, in a single session chaired by Jim O'Brien with 7 members and 8 guests present. One guest joined a working group as a member.

The chair distributed the latest draft of the Report.

The latest received contributions and missing assignments were discussed during the meeting.

Clause 4.1.3 *Tokyo Electric's Predictive Out-Of-Step Protection* was re-written and moved to Future Applications section as clause 5.9.1.

Clause 4.13 *Distance to Fault* was re-written and its figures corrected.

References to C37.118 were updated to include C37.118.1 and C37.118.2.

Additionally, Damir Novosel edited clause 5.1 *Voltage Instability Predictor* and added clause 5.14 *Synchrophasor-based Backup Protection*.

The new assignments were distributed as following.

Damir Novosel will review clauses 5.3 *Differential Relaying* and 5.4 *Synchrophasor Application to Line Differential Protection*. Although previously they were considered to be combined, it appears, after additional review, that clause 5.3 talks about the bus differential protection while clause 5.4 about the line differential protection; therefore, they will stay separate. The SEL-based figures will need to be re-drawn to represent a generic case.

Damir will also correct the reference to the NERC evaluation of the Zone 3 distance characteristics in clause 5.14.

The figures in the report need to be edited for consistency in visual representation. Jim O'Brien will send the original contributions to Harold Kirkham so Harold can complete this task.

Additionally, Figure 2.2 will need to have the axis descriptions corrected. The numbers will need to be assigned to figures on pages 6 and 47. Present figures 5.12 and 5.13 will need to have their titles corrected by removing their sources of reference.

The equations in the Report will be re-numbered, on the per-section basic, throughout the document (i.e. 4.1, 4.2, 5.1, 5.2, etc).

All new assignments are due in month, by October 15th, 2012.

The Report stays approved by the working group, and there is no need to re-ballot it.

The Report will be submitted to the Subcommittee C for approval towards the end of 2012.

The volunteers from the WG members will be needed to put together a Power Point presentation for one of the future PSRC Main Committee meetings.

Also, the group discussed a future paper to be presented at the relay conferences. This topic will be further addressed at the January 2013 meeting.

C15: Design and Testing of selected SIPS

Chair: J. Sykes

Vice-Chair: Y. Hu

Output: Report on industry practices in design and testing of selected SIPS

Established: September 2008

Expected Completion Date: December 2012

Assignment: Write a report in industry practices and testing of selected SIPS (System Integrity Protection Schemes)

Working group C15 met on Tuesday, September 11, 2012 in Portland, OR, in single session chaired by Jonathan Sykes and Yi Hu with 10 members and 8 guests attending.

Yi Hu provided a summary of the C subcommittee voting results of the report, and the proposed process for the working group to resolve the comments received during the C subcommittee voting process. The report has been approved by the C subcommittee with 31 votes (30 positive, 1 negative) received from 36 committee members. The meeting then proceeded on the comments resolution with the following actions:

- Reviewed and resolved all (seven in total) comments in the technical category
- Decided all comments in editorial category will be addressed by working group's editing team after the meeting
- The finalized report will be submitted to C subcommittee and request the PSRC officers approval for publishing it on the PSRC web site

Working group then discussed the plans to publicize the report in relevant conferences and publications. The followings have been decided:

- WG will produce a two-page summary based on the Introduction section of the report
- WG will prepare a presentation slide deck for use at the targeted conferences
- Targeted conferences
 - Conferences in USA: Georgia Tech Relay Conference, Texas A&M Relay Conference, WPDAC and Western Relaying Conference
 - International conferences: APAP Conference in Jeju Korea, PAC Conference in Dublin
- Alex Apostolov will write a short article (1-2 pages) about the report in PAC World Magazine with link to the full report at PSRC web site after it is published

The working group will meet at next PSRC meeting in one session to discuss the draft presentation slides and paper submission status.

C16: Relay Scheme Design Using Microprocessor Relays

Chair: R. Lascu

Vice-Chair: T. Seegers

Output: Report

Established: September 2008

Expected Completion Date: To be determined

Assignment: Write a supplement to the existing 1999 relay trip circuit design paper as an IEEE report to address microprocessor relays.

Working Group C16 held its meeting on Monday afternoon with 12 members and 10 guests attending.

The working group discussed assignments received for draft 2.9 of the report.

The following assignments were made:

Mike Thomas will review and make additions to section 3.1

Tony Seegers will incorporate changes from meeting discussions and perform an overall general edit of the document.

All assignments are due by October 15

Following receipt of the assignments, the report will be circulated to the working group for informal ballot. If this ballot can be resolved by January, it is expected that the report will be ready for subcommittee review following the January meeting.

C17: Fault Current Contribution from Wind Plants

Chair: D. Miller

Vice-Chair: G. Henneberg

Output: Report by the Joint Working Group

Established: January 2009

Expected Completion Date: 2012

Joint WG Assignment: To characterize and quantify short circuit current contributions to faults from wind plants for the purposes of protective relaying and equipment rating, and to develop modeling and calculation guidelines for the same.

C-17 WG Assignment: To support the activities of the Joint Working Group on Fault Current Contributions from Wind Plants.

The Joint Work Group met in conjunction with the PSRC meeting in Portland, OR on Tuesday September 10, 2012 with 16 members and 27 guests.

Introductions were made and the assignment for the working group was presented. Copies of the minutes from the July 26, 2012 at the PES General Meeting were distributed. These minutes had been emailed to the working group members earlier. One minor correction was made to these minutes.

Substantial progress has been made with the report. All of the earlier writing assignments have been incorporated into the current draft of the report. Sukumar Brahma will verify that the references made in section 3.2 to figures in section 3.1 are correct. An addition to section 3.4 on type IV WTG is expected from Markus Fisher by the end of September.

Charlie Henville discussed the new report sections 6.1.1 and 6.1.2. These sections describe performance characteristics of Type III and Type IV machines as non-linear response curves showing current output vs. MV bus voltage. It is believed that this sort of characteristic could be provided by manufacturers without divulging any trade secrets and could be used by modeling programs such as ASPEN, CAPE and others to model machine performance.

An editorial team lead by Gene Henneberg and including Ernst Camm and Wayne Dilling reviewed the report and produced version 8.02. This draft of the report which had been emailed out to members earlier was distributed at the meeting. The general objective is to use a consistent style, minimize repetition and ensure an accurate final result. Gene led the general discussion on the report. Several figures in section 2 showing various system configurations include non-standard symbols and provide overlapping information. These will be re-drawn and consolidated. The report will use a general rule that the source side for a wind turbine will be shown on the left and terminals on the right. Where connections to the system are shown, the WTG will be on the left and the system on the right.

One of the important report references is to a paper posted on the WG web site. It is not clear whether this reference would still be generally available after this report is published. This subject was raised at the C subcommittee meeting on September 11, with the result that provisions would be made to post this material with the finished report.

The editorial team expects to provide the next version of the report to the working group for balloting during November and discuss comments received at the January meeting.

The completed report will be a product of all the three technical committees: Transmission & Distribution, Electrical Machinery, and Power System Relaying. It will need to follow the rules of all three committees for the review of a committees' special report. After the issues from review at the January meeting have been resolved the report will be submitted to the PSRC System Protection subcommittee for membership review and balloting. The result of that review will then take a parallel review path to the offices of the PSRC, T&D committee and the Electric Machinery committee. Any issues produced by those reviews will be resolved by a committee of the working group representing members from all three of the technical committees. The report will be then ready for publishing. One site for the report will be on the PSRC web site. The report will also be available on sites supported by the T&D and Electric Machinery committees.

C18: Transmission to Generation Interconnection Protection Considerations

Chair: Alla Deronja

Vice-Chair:-

Output: IEEE Guide

Established: September 2011

Expected completion date:- TBD

Assignment: *Develop a Guide for Protection Systems of Transmission to Generation Interconnections.*

Scope: This Guide documents accepted protection practices for transmission to generation interconnections. It is intended to cover the protection system applications at the interconnections between the transmission systems and generation facilities.

Purpose: This document is intended to provide guidance to those who are responsible for the relay protection of electrical interconnections between transmission and generation facilities. This Guide is not intended to supplant specific transmission or generator owner practices, procedures, requirements, or any contractual agreement between the transmission and generator owners.

Working group C18 met on September 12, 2012, in Portland, OR, in a double session chaired by Alla Deronja with 8 members and 31 guests present. Three guests joined the working group as new members.

The purpose of this working group is to write and industry-wide IEEE Guide for the transmission to generation interconnections driven by the following reasons:

1. Separate ownership of transmission and generation.

2. Power producers, being connected to the power grid, may fail to install the adequate protective equipment at the point of interconnection because of the limited expertise of their consultants and/or desire to install the facilities with the least possible cost.
3. Many utilities have interconnection agreements with power producers. Although independent and specific for different regions, they ought to have many commonalities, which can become a part of the industry-wide standard and drive the application consistency. At the same time, different acceptable practices will be also outlined in an industry-wide standard.
4. An industry-wide standard will make transmission to generation interconnection protection more consistent among the various utilities and will support NERC reliability standards.
5. Transmission entities will have a better reference – the industry-wide standard - to justify their requirements to protect their systems and customers from a negative effect of a failure of a single generator or generating facility.
6. The protection requirements in individual interconnection agreements will be based upon the industry-recognized standard.
7. Power producers and their consultants will be educated based on the industry-recognized standard rather than on individual interconnection agreements of various utilities.

Presently, the proposed Scope and Purpose for the Guide are as follows:

Scope:

This Guide documents accepted protection practices for transmission to generation interconnections. It is intended to cover the protection system applications at the interconnections between the transmission systems and generation facilities. This Guide does not cover distributed energy resources.

Purpose:

This document is intended to provide guidance to those who are responsible for the relay protection of electrical interconnections between transmission and generation facilities. This Guide is not intended to supplant specific transmission or generator owner practices, procedures, requirements, or any contractual agreement between the transmission and generator owners.

The chair submitted a request for a PAR to the IEEE SA in summer of 2012. The following concern regarding the proposed scope for the Guide from the IEEE Standards Coordinating Committee 21 (SCC21) has put the PAR approval for project P1880 on hold.

Phil Winston, the PSRC Standards Coordinator, explained that the absence of generator MVA limits and voltage limits for transmission system from the Guide scope causes a concern with the SCC21 members as potentially infringing on the work of the 1547 Series of Interconnection Standards, which deal with interconnecting distributed resources with electric power systems.

The working group had also a phone conversation with SCC21 vice-chair Tom Basso to understand the problem.

During the first session of the meeting, the working group reviewed the Scope and Purpose of the future Guide. There was a proposal to add a note that generators, being connected to transmission, are greater than 10 MVA because P1547 deals with the generators less than 10 MVA. Again, the third time around, the working group felt that putting this restriction is inappropriate because a transmission owner would not amend their requirements based on a size of a generator or facility being connected to its grid.

Another proposal was to define the transmission system voltages as 23 kV and above. This restriction was also not favored by the working group because utilities define their transmission systems as they see fit and may consider systems with even lower voltages as part of their transmission.

In general, the working group would not want to limit the size of the generation or transmission system minimum voltage because it would unnecessarily restrict the usage of the Guide should a utility or power producer need to make a non-standard interconnection: either connect a small (<10 MVA) generator to the transmission system or utilize low voltage lines as part of the utility's transmission system.

However, in no way, this Guide would infringe on the P1547 work scope.

The working group agreed to add to the Scope of the Guide the following statement: *This Guide does not cover distributed energy resources*. This would help to put a boundary line between the P1547 and PSRC work. Whether it is enough to approve the PAR remains to be seen.

Also, the working group is in agreement that the Scope of the Guide is concerned with the generating units or generating aggregates, which are being connected to the transmission grid via the generator step-up transformers.

The final resolution was not reached but may be communicated via email with the working group members before the January 2013 meeting.

At the second session of the meeting, we had two presentations on utilities' protection requirements for the interconnections with generation: one from Xcel Energy by Heather Malson and the second one from PG&E by Mike Jensen. Thank you, Heather and Mike. Their presentations will be posted on the PSRC WG website.

We plan more presentations at the January 2013 meeting as follows:

1. Mohammed Zubair (HydroOne)
2. Doug Hunchuk (Alberta System Operator)
3. Joe Mooney (Power Engineers - consultant perspective)
4. Mukesh Nagpal (BC Hydro)
5. Alla Deronja (ATC)

Any other volunteers to make a presentation from their utility or consulting perspective are welcome and should contact the chair of the working group (aderonja@atcllc.com) before the January meeting.

Participation of power producer representatives such as consulting firms is very encouraged as well as from many utilities. Please contact the chair (aderonja@atcllc.com) if interested to be included on the distribution list.

CTF3: Joint meeting with Power System Dynamic Performance Committee (PSDP)

Chair: C. Henville

Vice-Chair:-

Output: Recommendations to the Subcommittee regarding possible joint activities

Established: January 2010

Expected completion date:-

CTF3 met in Portland with one member and five guests present.

Alex Apostolov presented the paper on an update to "Protection issues during system restoration" to a joint panel session (on system restoration) with PSDP at the PES GM in July 2012. This presentation was very well received, and the PSDP extended its thanks to Alex and the PSRC.

The following presentations were also made at the special PSRC Activities Session at the GM. Roger Hedding chaired this session.

- Protective relay performance during stressed system conditions (Pratap Mysore)
- Undervoltage load shedding (Miroslav Begovic)
- New synchrophasor standard developments (Farnoosh Rahmatian)
- Protection Redundancy Considerations (Solveig Ward)
- Fault current contributions from wind farms (Dean Miller).

These presentations were well attended and created a great deal of interest and questions among the attendees. It is hoped that PSRC can arrange other similar presentations in the future. It is expected that time slots will be available, at future PES general meetings.

Regarding future activities,

1. The Power Systems Dynamic Measurements Working Group has agreed to jointly sponsor a session on the four new synchrophasor standards sponsored by PSRC. Four PSRC working groups will make presentations on the work the working groups are doing (or have recently completed) in the area of synchrophasor standard development. In addition, Arun Phadke has agreed to make an introductory presentation on the history and of synchrophasor development and some applications. A representative from the PSDP will also make a presentation on other applications of synchrophasors.
2. The Rotating Machinery Subcommittee of the PSRC has agreed to set up a task force to “Investigate the modeling of out of step conditions and the coordination of generator excitation control systems with protection systems with the help of the Excitation Controls Subcommittee of the Energy Development and Generation Committee and the Power Systems Dynamic Performance Committee.” This task force will work closely with CTF3
3. No work is presently under way on the possibility of joint activity with the Power System Instrumentation and Measurements (PISM) Committee regarding work on frequency measurement and definition.

CTF19: Standard for Phasor Data Concentrators (PDC) for Power Systems

Chair: Vasudev Gharpure

Output: Standard

Assignment: Should C4 activity (PC37.244) continue to become a standard?

Task force CTF19 met on September 11, 2012 in Portland, OR in a single session with 24 attendees. This was the first meeting for this task force.

The meeting started with introductions. A list of attendees is included at the end of this document.

The chair (Vasudev Gharpure) provided a history of PDC efforts. This included a summary of the PDC Guide (PC37.244) currently under work and expected to be completed in the near future, the distinction made between a device and a function for a PDC by the Guide, and the inclusion in the Guide of functions that are not currently implemented. It is expected that any serious work on the standard would not begin until the Guide is complete, as the same members are expected to continue to work on the standard.

Ken Martin raised a question: Who is asking for this work (a PDC standard)?

Arun Phadke responded: Many users appear to be interested internationally. Many of them are new to this technology. They are asking for a standard to use, to support minimum functions needed for a PDC. This would help them with interoperability and system specifications.

Allen Goldstein commented: One of the challenges is to come up with the requirements that are real and can be done, and every device claiming to be a PDC needs to be doing these minimum set of functions. The Guide includes many functions that are currently not implemented, but would be useful for a PDC to have. It may not be possible to include these in the standard. Other standards have taken the approach of including these as informative annexes that (eventually) may or may not make it into subsequent revisions of the standard, depending on how the industry evolves.

There was a discussion on a proposed statement of assignment. This included “communications”, which was considered too broad by several attendees.

Matt Ceglia suggested that the task force may consider asking the Power System Communication Committee to join the effort, or to co-sponsor it, if that is beneficial.

After further discussion, the expression “data transfer” was substituted for “communications”, which was deemed to be too broad for the scope.

Further discussions removed this expression too from the assignment statement, with the understanding that a short and succinct assignment statement would be preferable, with the details included in the scope / purpose in the PAR. The final assignment statement is:

Assignment: Develop a standard for Phasor Data Concentrators for Power Systems.

Representatives of three PDC manufacturers present at the meeting (Alstom, EPG, GE) are in agreement that it is beneficial to have a standard for PDCs.

Action:

- Vasudev Gharpure to circulate a draft for the scope and purpose of the working group, to the attendees.
- Attendees to comment on the draft.

D: LINE PROTECTION SUBCOMMITTEE

Chair: R.W. Patterson

Vice Chair: G.L. Kobet

The Subcommittee meeting was called to order at 4:30 p.m. with 31 members and 27 guests present.

Following introductions, a count of SC membership was made, and it was determined a quorum was present (30 out of 48 members present).

Minutes from the May 2012 meeting in New Orleans LA were approved.

Chairman Patterson reported items of interest from the Advisory Committee:

- Meeting room requests for January 2013 are to be submitted to Mike McDonald (PSRC Secretary) by October 1.
- PES listing update, including WG/TF/SC memberships, is due to Mike by October 15.
- Presentations are requested for January/May 2013 Main Committee meetings. D2 and D11 both plan to present at the January 2013 meeting.
- NERC cybersecurity expert Scott Mix will attend the January 2013 PSRC meeting for a presentation to the Main Committee. D-SC members should e-mail suggested topics/questions to Mike by October 15.
- The deadline for the Call for Papers to the Georgia Tech Protective Relaying Conference is September 28. WGs that have completed their work should consider submitting an abstract.

Reports from the WG Chairs:

D2: Revision of C37.104 Transmission and Distribution Reclosing Guide

Chair: Gary Kobet

Vice Chair: Greg Sessler

Output: IEEE Guide

Established: September 2008

Completed: June 2012

Assignment: Revise and update the IEEE Guide C37.104 – Guide for Automatic Reclosing of Line Circuit Breakers and AC Distribution and Transmission Lines

Working Group D2 held its meeting in a short single session on Wednesday, September 12, 2012.

There were 15 WG members present and a quorum was not reached. 13 guests attended the meeting.

The IEEE patent requirement slides were presented, and attendees were given the opportunity to identify any known patent claims.

Since quorum was not reached, the WG members will review and approve the minutes from the May 2012 meeting.

The document was approved by IEEE-SA on June 8, 2012, and a complimentary .pdf copy of the published document was provided to WG members by IEEE-SA.

A few members of the group will develop a presentation to be made at the Main Committee meeting in January 2013. Ken Behrendt, Charlie Sufana, Bruce Mackie, and Gary Kobet will work on this.

Since the assignment has been completed, the Chair plans to recommend disbanding the group at the subcommittee meeting. (NOTE: D-SC approved, D2 disbanded.)

D3: Considerations in Choosing Directional Polarizing Methods for Ground Overcurrent Elements in Line Protection Applications

Chair: Meyer Kao

Vice Chair: Elmo Price

Output: Report to the Line Subcommittee of the PSRC

Established: September 2009

Expected completion date: September 2013

Assignment: Prepare a report to the Line Subcommittee of the PSRC on identifying different polarizing methods, address issues related to the application of different methods, and make recommendations in choosing the polarizing method.

D3 working group held its meeting on Tuesday September 11, 2012, at 3:00 PM with 11 attendees, of which 3 are guests

Meeting minutes from the New Orleans meeting was presented with no objection.

Writing assignments assigned from the previous meetings were discussed.

Draft report was sent out to working group members and guests prior to the meeting for comments. Some of the feedbacks were discussed in the meeting. Cristian Paduraru, Mark Shroeder, Elmo Price, and Meyer Kao volunteered to address those comments of various sections. Cristian volunteered to review sections 3.1 and 3.2 to remove redundancy. Mark Shroeder volunteered to review section 4.1 to check for redundancy, Elmo Price volunteered to review the equations in section 4.3. Meyer Kao volunteered to address the comments in sections 3.1 and 4.1.

Meyer Kao and Gary Kobet volunteered to write section 6.0 on making recommendations in choosing the polarizing methods.

Writing assignments are due October 15, 2012. After the writing assignments are submitted and incorporated in the report, the copy of the draft report will then be distributed to members and guests for more comments.

D6: AC Transmission Line Model Parameter Validation

Chair: Tony Seegers

Vice Chair: Sam Sambasivan

Output: Report to PSRC

Established: January 2009

Expected completion date: May 2013

Draft: 6.4

Assignment: The WG will prepare a report to the main committee on the processes, issues, problems and methodology of validating software model parameters for AC transmission lines used for relaying. The report will not include details of relay curve models or other similar relay modeling. The report will also not include specific EMTP modeling.

The D6 working group met on Tuesday, Sept 11, 2012 at 8.00 a.m. with 12 members and 14 guests present.

Revision 6.4 of the document was sent to the members prior to the meeting. Members and guests were asked to comment on the latest draft. The following assignments were made:

Tony Seegers will modify the introduction, add sections removed from 3.2, and edit the document

- Ken Behrendt will add material to 4.1.4 on fault location
- George Bartok will add material to 3.2 on resistance
- Norm Fischer will add material on 3.2 to capacitance
- Yanfeng Gong will add example to 4.2.1 on two ended accuracy

The following item is still due from the May meeting: Pratap Mysore will provide a contribution to add a section 4.3 Inaccuracies of Measurement.

All contributions are due by October 12.

D11: Effect of Distribution Automation on Relaying

Chair: Fred Friend

Vice Chair: Jerry Johnson

Output: Report to the PSRC

Established: May 2006

Expected Completion Date: October 2012

Draft: Final

Assignment: Prepare a special report to the PSRC that describes the effect of Distribution Automation on Protective Relaying

The working group, chaired by Fred Friend, met in a single session on Tuesday (plus an additional a half session on Wednesday) with 12 members and 18 guests present. Minutes from the May meeting were approved without comment.

The subcommittee ballot results were discussed:

- 82% approval
- 2 negative ballots, neither of which were present at this meeting
- 47 comments were submitted

The comments were reviewed with much discussion, as usual, and more changes were made.

- Figures 3.3 and 3.4 will be revised
- Sections 3.2.1 and 3.2.2 were revised and moved to section 3.6.7.2
- Section 3.6.6 was revised
- Various editorial changes were made throughout the report

The chair will finalize the changes, update the comment spreadsheet and circulate to the working group along with balloters who submitted comments. The chair will also prepare a summary presentation (to be made at the January 2013 Main Committee meeting) and circulate it to the working group members for comment.

D19: PC37.113, DRAFT Guide for Protective Relay Applications to Transmission Lines

Chair: Rick Taylor

Co-Chair: Don Lukach

Output: Revised IEEE Guide C37.113

Established: September 2011

Expected completion date: September 2013

Draft: ?

Assignment: Revision of IEEE C37.113

Scope: Concepts of transmission line protection are discussed in this guide. Applications of these concepts to various system configurations and line termination arrangements are presented. Many important issues, such as coordination of settings, operating times, characteristics of relays, impact of mutual coupling of lines on the protection systems, automatic reclosing and use of communication channels are examined. Special protection systems, multi-terminal lines and single phase tripping and reclosing are also included. The impact that system parameters and system performance have on the selection of relays and relay schemes is discussed as well.

The D19 working group met in a single session on Tuesday, September 11. Following introductions, quorum status was confirmed to be short one person with 11 of our 24 Balloting members present. This failure to attract required members had no significant effect on this meeting, but will require us to approve the minutes from the May meeting by e-mail. Our efforts to assure a ballot quorum failed. Although I am not personally supportive of this quorum concept, it is required by IEEE SA. We may have to resort to other ways to gain the necessary attendance. If you cannot attend the meeting and you are a balloting member, perhaps it will be acceptable for you to submit a proxy authorization to either Don Lukach or me. I will verify if this would be allowed.

On the positive side, all of the task force groups working on review of sections of the guide submitted their revisions. Tom Weidman's report was not reviewed by the other members of his team. Paul Elkin and Steve Conrad agreed to an expedited review of the 5.6 to 5.11 section of the draft.

A team was formed to verifying the flow of the document and the consistency of figures, symbols, and terminology. This team consists of Clare Patty, Joe Mooney, and Sukumar Brahma verifying flow; John Miller reviewing drawing and figure consistency; Elmo Price reviewing the polarization data in section 6.4; Norman Fischer is reviewing section 6.4.2; and Don Lukach is reviewing Figure 57f and Figure 57D.

The time line recommends subsection reviews completed by October 15, the re-assembled draft completed by October 31, and the transition team recommendations being submitted by November 26.

D21: Supporting IEC Standard for Distance Relay Characteristics

Chair: Alex Apostolov (aapostolov@ca.rr.com)

Vice Chair: Alla Deronja (aderonja@atcllc.com)

Output: IEEE/IEC Standard

Established: September 2006

Expected Completion Date: December 2012

D21 did not meet, but the latest version of IEC-60255-121 is out for vote. Anyone wishing to review the document and vote should do so before end of December 2012. Eric Udren and Murty Yalla request comments by December 13, 2012.

D22: Performance Testing of Transmission Line Relays for Frequency Response

Chair: Tom Wiedman

Vice Chair: Jun Verzosa

Output: Report

Established: May 2007

Completion Date: September 2012

D22 did not meet. WG is waiting on NERC SPCS comments. As of September 2012, NERC SPCS did not have this report on their agenda for review.

D24: Transmission Line Applications of Directional Ground Overcurrent Relays

Chair: Don Lukach

Vice Chair: Rick Taylor

Outputs: Report to WG D19, PC37.113, Guide for Protective Relay Applications to Transmission Lines and Report to the PSRC

Established: May 2007

Expected Completion Date: September 2013

Draft: J

Assignment: Prepare a report to the Transmission Line Guide revision working group and PSRC on the justifications and application criteria for directional ground overcurrent relays

The working group (WG) met with 12 members, 6 guests, for a total of 18.

The May, 2012 meeting minutes were approved as submitted.

The WG discussed the latest draft of the report, Draft J. The vice-chairman submitted several revisions to this draft that were all discussed. Also the figure that was in the summary was moved to another section and discussed. Action items resulting from the working group include the following:

- Revise the combined impedance figure Don Lukach
- Condense the negative sequence section, Don Lukach
- Condense the comparison section of ground impedance to overcurrent relaying by removing excessive impedance discussions. Mark Schroeder
- Revise Section 5.4 by finding the reference or delete section. Bruce Mackie
- Review mutual coupling section for excessive information. All WG members

In the interim between the May and September meetings the following working group members supplied revisions to figures in order to provide a consistent format:

- Mike Bloder 5.3.3, 5.6.1, 5.6.2
- John Miller All others excluding 5.10.3, 5.10.4, 5.10.5

Assignments are due October 31, 2012.

Draft K of the report is expected by November 26, 2012.

D25: Distance Element Response to Distorted Waveforms

Chair: Karl Zimmerman

Vice Chair: Aaron Martin

Output: Technical Report to Line Protection Subcommittee

Established: January 2009

Expected completion date: January 2013

Draft: 2.0

Assignment: Write a technical report to the Line Protection Subcommittee on the performance of distance elements with distorted waveforms.

The working group met in Portland, OR September 12 at 11:00 AM with 8 members and 11 guests. Introductions were followed by a review of the September meeting minutes.

Introductions were made.

Karl Zimmerman began the meeting discussing changes to the latest draft.

- paper reworked for IEEE format
- Revised transformer inrush section
- Added CVT/distance element
- Removed following proposed sections
 - Nonlinear Loads
 - Wind power and other nonconventional sources
 - AC / DC Conversion

Karl then requested volunteers to add quadilateral content to Distance element (section 2). Joe Mooney volunteered to add this.

Karl went on to discuss the need for more development of solutions to the applications (section 3) and asked for volunteers to review the section. All authors of the applications of section 3 were asked to revise their sections to better summarize the solutions and separate them out. Karl proposed to add a table to summarize the Section III Applications subsections and to write a section to address the areas that would apply to paper's subject but where there is little to no data.

Technical discussion of the transformer inrush solutions followed. Joe Mooney mentioned he had data from test cases and actual events and he would share that data with Elmo Price.

Mansour Jalali brought up the subject of the impact of SVCs on distance elements and mentioned he had simulation data. He was then asked to write up section on this data. This will be considered as a section under (Section III) Applications.

Norman Fischer mentioned charging currents of long lines and volunteered to write up the subject. This would be considered under (Section III) Applications. Don Sevcik agreed to review the paper errors.

Tracked changes will be implemented from this point forward and Draft 2.0 sent out to working group members before next meeting.

Working group members were asked to hand in their comments by Mid November.

D26: Revision of C37.114 Fault Location Guide

Chair: Joe Mooney

Vice Chair: Randall Cunico

Output: IEEE Standards Guide

Established: 14 Jan, 2010

Expected Completion Date: December 2014

Draft: 2

Assignment: Update and revise C37.114: IEEE Guide for Determining Fault Location on AC Transmission and Distribution Lines to include new developments in fault locating methods and techniques.

The chair reviewed the IEEE Patent Policy and attendee's were provided the opportunity to respond. There were no responses.

There were 30 attendees with 15 members and 15 guests. Quorum was met with 13 of 18 balloting members being present. Minutes from the January meeting in Garden Grove and the May meeting in New Orleans were approved.

The Working Group reviewed Draft 2 of the guide. Revisions have been made to clarify the definition of determining fault locating error and additional material has been added to applications in distribution fault location.

The WG Chair pointed out that the remaining material should focus on fault locating applications on series compensated lines, synchronized phasor measurement techniques and travelling wave methods. Several Working Group members volunteered to create and submit the needed material:

Normann Fischer, Rafael Garcia, Damier Novosel – Series Compensated Lines

Karl Zimmerman, Gabriel Benmouyal – Synchronized Phasor Measurement

Normann Fischer – Travelling Wave

Brian Boysen – Figure showing one-line showing the configuration for the distribution example

The WG Chair requested that the Working Group submit final material and additions to be added to the guide for the January 2013 meeting with the goal of finalizing the revisions by the May 2013 meeting for submission to the D-Subcommittee for approval. Submissions should be sent to Working Group Chairman by the end of October 2012.

The WG Chair requested that a Working Group member review a paper submitted by Steve Turner to determine where and how the paper content applies to the guide. Gabriel Benmouyal volunteered for the review.

Rafael Garcia suggested that the guide be reviewed for content and “readability”. The WG agreed that this would be a good idea and would be done after the new content has been added.

Yanfeng Gong presented material on a two-ended technique using synchronized sampling, locating faults on a non-homogeneous lines, and distribution feeders. The presentation was well received and the Working Group members agreed that the material should be included in the guide. Yanfeng volunteered to submit the needed material.

D27: Guide for the Application of Digital Line Current Differential Protective Relays Using Digital Communications PC37.243

Chair: Solveig Ward

Vice Chair: Bruce Mackie

Established: Sept 2010 (PAR approved)

Output: IEEE Guide PC37.243

Expected Completion Date: December 2014 (PAR expires)

PAR expiration date: Dec 31, 2014

Assignment: Create a Guide for the Application of Digital Line Current Differential protective relays using Digital Communications

Scope of work: This guide presents practical line current differential schemes using digital communication. Operating principles, synchronization methods, channel requirements, current transformer requirements, external time reference requirements, backup considerations, testing considerations and troubleshooting are included. It also provides specific guidelines for various application aspects including multi-terminal lines, series compensated lines, mutual coupled lines, line charging current, in-zone transformers and reactors, single-pole tripping and reclosing, as well as, channel and external time source requirements.

WG D27 met on Tuesday, September 11, 2012 in a single session with 12 members and 16 guests. A quorum was present and the May minutes were approved (with note of misspelling of Alla Deronja's name). The participants were reminded of the applicable IEEE intellectual property rules.

A new draft was issued following the May meeting. Two contributions were received after this time; Ilija Voloh (in-zone transformers) and Ljubomir Kojovic (Rogowski coils). Joe Uchiyama had completed a review that also had not been implemented. Joe will send his review to the Chair within a week.

In zone transformers will be merged with the existing section 6.13; tapped loads. Ljubomir's write-up will be included in a new section: Current Measurement Techniques. This section will also include CT requirements, and the CT related sections 6.5 and 6.9. Ilija Jankovic will add a section for IEC 61850 process bus measurement.

Section 5.10 (testing) will become a new section 7. Bill Higinbotham will provide a draft, including both pickup testing and communications testing.

Solveig Ward volunteered for Section 6.3 (dual breakers) and 6.4 (sensitivity, etc.). Brief settings considerations will be included.

Don Lukach will provide a review of possible overlap of sections 5.8 and 6.14, due to the Chair by mid-October.

Items that could be covered in 6.16, Ancillary functions, are DTT, double ended fault location, out-of-step, status transfer, 85CO (Alla Deronja to provide write-up), charging current compensation. This section has been assigned to Sam Sambasivan. Phil Beaumont has a paper describing these functions and will send a copy to the Chair for forwarding to Sam.

Solveig Ward will add an introduction (why to use current differential protection), possibly referencing the Line Protection Guide.

Section 4.2 needs an introduction, Solveig will add.

The scope includes mutual coupling. Bruce Mackey will write a section.

Shunt reactor write-up will be provided by Ilia Voloh. Alex Lee will cover shunt capacitor applications.

Mark Schroeder will add a paragraph for discharging current to the charging current section.

Phil Beaumont will provide a write-up for IEC 61850-90-1TR in Section 5.9.

The team reviews (as assigned at the May meeting) remain outstanding:

Section four will be reviewed by Haile Gashaw, Joe Uchiyama, Mark Schroeder, Demetrious Tziouvaras, and Mani Sankaran. Section 5 will be reviewed by Bill Higinbotham, Solveig Ward, Jun Verzosa, and Ilia Voloh. Section 6 will be reviewed by Alla Deronja, Sam Sambasivan, Ian Tualla, and Vajira Pathirana.

Assignment deadlines:

- Joe Uchiyama to send already completed review to the Chair within the next week
- Don Lukash review to the Chair by mid-October
- Chair to send out latest draft by end October
- Review teams to provide contributions by December 15
- All outstanding writing contributions are due by December 15

SC Motions to be made to Main Committee

None

Coordination Reports

None

Liaison Reports - Fred Friend

The T&D Committee / Distribution Subcommittee met during the IEEE PES General Meeting in San Diego, CA, 22 – 26 July 2012.

Their next meeting is the joint technical meeting January 14 – 17, 2013 in Memphis.

The following are items of interest to the Line Protection Subcommittee:

Working Group on Distribution Automation <http://grouper.ieee.org/groups/td/dist/da/>
George Simard, Chair Larry Clark, Vice-Chair Bob Uluski, Secretary

Continued discussion on developing the Application Guide for Smart Distribution, P1854

IEEE PES General Meeting, Vancouver, British Columbia, Canada, July 21 – 25 2013

Updated DA Tutorial

Panel session on “Smart Distribution Control Center”

Volt-VAR Control Task Force

Discussion to create a guide or recommended practice for determining the effect of reduced voltage on electric power demand and energy consumption on electric power systems.

Discussion to write a white paper on Volt-VAR Control.

Distribution Management System (DMS) Task Force

Discussion regarding vision, scope, objective, and deliverable for DMS – begin with panel session at the 2013 IEEE PES General Meeting

EPRI DMS Interest Group

Working Group on Switching & Overcurrent Protection <http://grouper.ieee.org/groups/td/dist/sop/>
Lee Taylor, Chair , Vice Chair Fred Friend, Secretary

Continued work on P1806 "Guide for Placement of Overhead and Underground Switching and OCP Equipment"

Scope: This guide is to provides criteria for switching and protective device placement for distribution circuits.

Purpose: This standard develops a guide for where and when switching and overcurrent devices are placed on the distribution system.

Old Business

None

New Business

It was noted that Dr. Mohindar Sachdev, a D-SC member, was recently named as recipient of the 2013 IEEE Charles Proteus Steinmetz Award. Recipient selection is administered through the Technical Field Awards Council of the IEEE Awards Board, for exceptional contributions to the development and/or advancement of standards in electrical and electronics engineering. The D-SC wishes to congratulate Dr. Sachdev for this prestigious honor.

General Discussion

Alex Apostolov, editor of PAC World magazine, requested that any WG/TF that has completed its work and wishes to publicize should consider submitting an article for the magazine or making a presentation at the PAC World conference.

Line Protection operations of interest

Gary Kobet made a presentation of a series of operations that occurred following failure of a 161kV bus VT.

Claire Patti discussed issues with a delay timer in protection for a tapped capacitor bank.

The meeting was adjourned at 5:45 p.m.

H: RELAYING COMMUNICATIONS SUBCOMMITTEE

Chair: Eric Udren

Vice Chair: Eric Allen

The Subcommittee met on May 16, 2012 with 26 members of 38 total, comprising a quorum. 36 guests were also present. Minutes of the May 2012 New Orleans, LA meeting were approved without objection.

The IEEE PES has formed a new Intelligent Grid Coordinating Committee (IGCC) to create a roadmap for developing "Smart Grid" standards. A PSRC representative is needed for the IGCC, which meets at the PES General Meetings.

Working Groups with PAR will be under new IEEE management procedures in 2013. Documented votes and membership management will be part of these procedures. New P&P documents are in preparation. In the meantime, Working Groups with a PAR should track attendance and manage membership. Members who are no longer regularly attending WG meetings but who have already submitted significant contributions may be classified as "non-voting members" so that quorum at WG meetings can be achieved.

A new IEEE Central Desktop tool for Working Groups is available. Sharepoint-like web space with public and private areas is provided.

The call for papers for the 2013 IEEE PES General Meeting in Vancouver is open. The deadline for submissions is November 30. The PSRC will host a session at the 2013 GM. H Working Groups that will have recently completed their work and are candidates to make presentations at the GM include H4 (COMTRADE), H16 (COMFEDE), and H8 (Use of COMTRADE for synchrophasors).

Scott Mix of NERC will speak about NERC CIP at the January 2013 JTCM in Memphis.

The annual PSRC directory update is due October 15. Working Group chairs and vice-chairs are asked to review the current directory (which will be sent out shortly after the meeting) and update their group's information, including member lists and assignment statements.

WG business:

The H3 WG presented a revised PAR title (one word added) to the Subcommittee for approval:

"IEEE Standard Requirements for Time Tags Created by Intelligent Electronic Devices – COMTAG(TM)"

The SC voted unanimously to approve the PAR title revision for the H3 working group.

The SC voted unanimously to approve the creation of working group H21 with Yi Hu as chair and the following assignment: Create an IEEE report documenting the mapping between IEEE C37.118 and IEC 61850-90-5 standards.

The SC voted unanimously to approve the creation of working group H22 with Stephen Thompson as chair and the following assignment: Develop an IEEE Guide on security for data files used for configuration, management, and analysis of protective relaying systems.

Old business:

The question of whether the recently completed report of the H10 WG (COMDEV: coming naming convention for IEDs) should be elevated to a standard or guide was raised.

The SC voted unanimously to approve the creation of the HTF23 task force with Rick Cornelison as chair to investigate whether the H10 report should be converted to a standard or guide..

New business:

Alex Apostolov invited subcommittee members to make submissions to PacWorld magazine in order to promote recent work of the Working Groups of the Subcommittee.

Reports from the WG Chairs

H1: PC37.236 Guide for Power System Protective Relay Applications over Digital Communication Channels

Chair: Marc Benou

Vice Chair: Ilia Voloh

Output: Guide

Established: 2006

Expected completion date: December 2013

Assignment: Develop a guide for application of digital communications for protective relaying systems and schemes, including transmitting and receiving equipment, digital channels, application principals, performance, installation, troubleshooting, testing and maintenance.

The H1 working group met with 7 members and 5 guests. After introductions, an agenda with the IEEE patent policy was distributed. We had a quorum and the May minutes were approved.

The balance of the 197 comments from the first ballot was reviewed. A few comments remain to be resolved. These will be addressed by the chairman and a few individuals of the working group over the next couple of weeks via email.

After the comments are resolved, the working group will proceed on submitting the guide for a second

ballot.

It has been requested that the assigned comment replies be submitted within 3 weeks.

H2: Relay Applications Using the Smart Grid Communications Infrastructure

Chair: M. Simon

Vice Chair: G. Antonova

Output: Report to the Subcommittee on title subject

Established: 2006

Expected completion date: September 2012

Assignment: Create a working group report to the Relaying Communications Subcommittee that describes example protective relay applications that can make use of the communication infrastructure provided by the Smart Grid. Protective relay applications will include potential capabilities and the communication requirements necessary to provide suitable communication architectures, services, capabilities, and any other pertinent characteristics.

The working group did not meet in Portland, OR. Revisions based on concessions comments from the subcommittee have been integrated into the draft. The draft was sent out for re-ballot and approved. The final version has been sent to the H subcommittee officers for posting on the PSRC web site. The working group has completed their assignment.

Next meeting: None

Status: Assignment completed. Awaiting web posting.

Scope: Done

Outline: Done

Draft: Draft Dec 7,2011

H3: Time Tagging for Intelligent Electronic Devices (IEDs)

Chair: W. Dickerson

Vice Chair: J. Hackett

Substations C4 Co-Chair: M. Lacroix

Output: Standard

Established: 2006

Expected completion date: December 2015

Assignment: Develop an IEEE Standard for time tagging for power system IEDs. This will include common requirements for time tags, and show how to apply them to various classes of time sequence data. Requirements and methods for stating the resulting time accuracy will be included.

The WG met on Tuesday, September 11, 2012 with 27 members and guests in attendance, with a quorum.

The meeting started with a discussion of PAR status. PAR submission was approved by Subcommittee H last May. Subsequently, the co-sponsor Substations Committee asked for a change to the title of the Standard, as follows:

**IEEE Standard Requirements for Time Tags Created by Intelligent Electronic Devices –
COMTAG(TM)**

The word 'Requirements' was added. There are no changes to Scope and Purpose. The WG discussed and consented to the proposed change, and requests the Subcommittee to approve the revised PAR for submission to the Standards Coordinator and NesCom. The PAR is currently ready for submission.

The meeting continued with two presentations by Mark Adamiak and Amir Makki. These continued a discussion started in the previous meeting regarding the attributes and requirements for time tags. Mark summarized several existing time tag formats, and pointed out their strengths and weaknesses (missing attributes). Amir discussed the attributes a time tag should provide. These presentations were largely in agreement with each other.

In the second session, these issues were discussed further. The scope establishes that we should specify the attributes of time tags. Amir pointed out that a time tag should include an identifier as to the type of the item being time tagged, in addition to the time information. Alex Apostolov suggested that perhaps a generic 'superset' of attributes should be created which could be mapped to existing or proposed time tag formats. Craig Preuss, Sam Sciacca and Marc Lacroix (of Substations Committee) expressed their Committee's need for a standardized enumeration of the types (or classes) of items to be time tagged in IEDs.

In response to the issue of uncertainties internal to the IED in generating time-tagged data items, beyond the internal clock and time-tagging process, John Tengdin suggested that one of the necessary attributes might be the expected internal delay and jitter for each type of item to be time-tagged. Mark Adamiak suggested that the well-established ISO 8601 Combined Date and Time Standard, used as a starting point in COMFEDE, is also a good starting point for any proposed time tag format incorporating the additional attributes required in the proposed Standard.

As the meeting came to an end, some writing assignments were agreed to. This moves the WG along in the process of establishing the 'superset' of time tag attributes.

H4: Revision of C37.111 COMTRADE Standard

Chair: R. Das

Vice Chair: A. Makki

Output: Standard

Established: 2006

Expected completion date: June 2013

Assignment: Revision of IEEE Std C37.111-1999 - IEEE Standard Common Format for Transient Data Exchange (COMTRADE) for Power Systems.

Meeting # 22

This standard is one of the critical standards identified by IEEE SA for Smart Grid activity.

The Group met on September 11, 2012, with 10 members present – 9 of them are voting members out of 17 voting members. Eight guests were present which include Matt Ceglia (IEEE-SA).

The minutes of the previous meeting held at New Orleans were approved.

Working group went through the comments received from IEC CDV and IEEE recirculation. All comments were resolved. Matt Ceglia helped with the response and has the final copy of the documents. Matt uploaded the IEEE comments resolution file to IEEE-SA website at the conclusion of the meeting. Matt will also provide the IEC CDV comments resolution document to Murthy Yalla for requesting IEC to initiate the FDIS as soon as possible so that this process can be completed along with the RevCom meeting in early December.

All attempts will be made to publish the final standard by the end of the year. There is no need for PAR extension at this stage.

The WG will meet again in January 2013 to evaluate the progress of the standard publication.

H5-a: Common Data Format for IED Configuration Data

Chair: J. Holbach

Vice Chair: D. P. Bui

Output: Report

Established: 2003

Expected completion date: June 2013

Assignment: Define a common format for IED configuration data.

The working group met on the 11th of September with 5 members and 5 guests. After introductions, the status of the report was reported and the next steps discussed. The report undergoes a technical writing

review by 4 working group members at this time. One member already finished the review. As soon as all review changes are included, the report is considered to be finished and send out to all members for approval.

Some of the technical writing review concerns were discussed during the meeting.
The membership list will be updated.

H6: IEC 61850 Application Testing

Chair: C. Sufana

Vice Chair: B. Vandiver

Output: Report

Established: 1999

Expected completion date: December 2014

Assignment: Write a report to the H Subcommittee on application testing of IEC-61850 based protection and control systems. Emphasis will be on the GOOSE functions.

Introductions were done after a welcome by Chairman Charlie Sufana. There were 14 members and 14 guests present.

The minutes from the May 2012 meeting were reviewed and approved with no comment.

Mansour Jalali provided a PPT presentation (will be provided to WG by email) on the experience of working with utilities involved with IEC 61850 test and commissioning of their projects. He presented a brief overview of the typical test procedures and the importance of engineering the system to be tested. The conventional requirements of testing involve the ability to perform certain procedures like selectively block, simulate, and monitor I/O and that some of these must be carried over to the 61850 implementations.

A comparison of the test concepts used under Edition 1 was contrasted with changes required under Edition 2. The concept under Edition 2 of the simulation flag (test bit) for GOOSE and Control constrains the test system to validate the state of the devices under test. This also means GOOSE subscription validation is required.

As an example, system integrators under Edition 1 had trouble verifying the subscription status of GOOSE messages in the network, now under Edition 2 this was improved with the LGOS logical node and Subscription Status attribute. This identifies that the device is receiving the subscribed messages. A similar ability is provided under LSVS for sampled value messages.

So the main message was that the ability to test any system must be engineered into that system from the start. The presentation was well received.

Charlie then reviewed the report outline and assignments of the working group and led a discussion on the writing assignments that were submitted since May. These included the introduction submitted by Aaron Martin, Application Testing for Methods and Tools submitted by Jason Bueno, and How to Test a GOOSE message by Charlie Sufana. Each was reviewed and discussed by the WG. A suggestion was made to include a section on testing Sampled Values messaging and Mansour and Yuchen volunteered to provide a first draft. Additionally, it was suggested to add a section on practical cyber security concerning bringing test devices, files, and PCs that would be connected to the substation network. Treating a laptop PC like a secure Test Set was proposed. This will be further discussed and cross referenced with ongoing efforts by other WG's or existing standards.

Remaining writing assignments were reconfirmed and are requested to be provided by Nov 16th, 2012. A revised outline with assignments noted by the topics will be sent out next week to all attendees.

H7: IEEE 1588 Profile for Power System Applications

(Joint Working Group of Substations Committee C7 & PSRC H7)

H7 Chair: Galina Antonova

Substations C7 Chair: Tim Tibbals

Vice-Chair: Bill Dickerson

Output: Standard

Established: 2008

Expected completion date: December 2013

Assignment: Develop an IEEE Standard “IEEE Standard Profile for Use of IEEE 1588 Precision Time Protocol in Power System Applications” in close coordination with IEC TC57 WG10 and other technical committees with similar interests.

Joint WG H7/Sub C7 met on Sept 11, 2012 in Portland, OR in a single session with 23 attendees (8 members and 15 guests). Quorum was not achieved. January 2012 and May 2012 meeting minutes were approved electronically prior to the meeting.

After introductions, co-chair presented IEEE IP policy slides and asked to bring any potential patent-related issues. None were identified.

Co-chair stated that a list of potential editorial and technical errors in IEEE C37.238-2011 was brought to our attention. A discussion on how to proceed with these followed. It was suggested to seek Working Group opinion on whether and when each item should be addressed, and make a decision on how to proceed based on this feedback. Options are corrigendum, amendment and a revision.

Discussion on IEEE C37.238 summary paper followed. It was agreed to keep PTP profiles descriptions, further discussions and updated figure in the WPRC paper. Minor modifications were made to address comments on PTP parameters. Updated version will be provided for Working Group for the final review.

Lloyd Green of IEEE ICAP gave a brief presentation on ICAP activities and interest in including IEEE C37.238 into this program.

H9: Understanding Communications Technology for Protection

Chair: R. Midence

Vice Chair: M. Sachdev

Output: WG Paper

Established: 2005

Expected completion date: June 2013

Assignment: Prepare a document that would assist engineers in understanding the communications technology for protective relaying.

The Working Group H09 met in the Salon Forum, Hilton Portland & Executive Tower, Portland, OR, USA on September 10, 2011 at 3:00 pm. Seven (7) members and eleven (11) guests were present.

For the benefit of new participants that attended the meeting for the first time, René Midence provided an overview of the Report. The chair informed that the report was submitted to subcommittee on April 10, 2012 for final review and approval and we are waiting for their comments or final approval. The chair informed that one member of the H Subcommittee have provided comments which were mostly editorial comments.

The chair indicated that there has been no progress prior to this meeting with regards to the preparation of a promotional material as recommended by the working group during the meeting of May 2012. The reason is because the final document has not been approved by the Subcommittee.

The participants confirmed that a paper and a tutorial or power point presentation should be prepared. It was agreed during the meeting that the promotional paper will mainly consist with a condensed version of Section 1 of the report with a brief summary of the content of the other sections. It is important to notice that Section 1 provides information of the evolution of the communications and also provides typical examples with reference to other sections of the report that contain additional information.

During the meeting of May 2012, Juan Gers, James Ariza, Vajira Pathirana, Alfredo de la Quintana, and Chris Chelmecki volunteer to assist in the preparation of the paper and power point presentation. Also Dominic Iadonisi volunteered to prepare a document outline and René Midence, Richard Harada, Bob

Ince volunteered to assist. The chair will contact the volunteers to coordinate efforts and to distribute responsibilities.

The chair requested more volunteers to produce slides based on the content of one or more sections. The chair explained that now that the report is almost completed, contributing should be a straight forward task of preparing presentation slides based on report content.

H11: C37.118.1 Standard for Synchrophasors for Power Systems

Chair: K. Martin

Vice Chair: B. Kaszteny

Output: Standard

Established: 2006

Expected completion date: December 2013

Assignment: Create a new Synchrophasor Standard C37.118.1, using the measurement portion of the current standard, C37.118-2005, and adding dynamic phasor measurement and frequency measurement requirements according to the PAR issued 17 June 2010.

WG H11 met on Wednesday, September 12, 2012 at 8:00 AM in a single session with 7 members and 18 guests. The attendees were reminded of the applicable IEEE intellectual property rules. The WG did not have a quorum and the May minutes will be approved by Email.

The chair reviewed the current standard status. It passed balloting and was published in December 2011. The WG is producing a summary paper and also gathering comments from vendors implementing the standard and others testing or otherwise using the standard.

The summary paper is now complete (all contributions have been received and put in the document) except for some figures which will be supplied by Jay/Harold by September 20. Some coordination editing has been done. The paper will be sent to several volunteer editors to complete the paper in its present form and length. The paper will then be edited down to the required transactions paper page limit. Currently transactions papers have an 8 page limit but conference papers have a 5 page hard limit.

Comments regarding the performance requirements primarily concern frequency and ROCOF. These limits are in some cases very difficult to achieve. There is at least one requirement which has a typographic error and a few more that have been called into question. The requirement for latency is not clear and may be in error. To address these issues the WG will collect information from testing to try to determine which requirements need to be changed. The WG will draft and send a letter to vendors to ask if they can provide information on their product's compliance with the new standard. The WG will also send a letter to NIST to ask if they would test and provide information to the WG as to the compliance of various PMU products. The WG will review the test data from Mladen K. The goal is to come up with a definite listing of changes needed by the January PSRC meeting with which the WG will request the appropriate PAR to make the needed changes in the standard.

H12: Configuring Ethernet Communications Equipment for Substation Protection and Control Applications

Chair: E.A. Udren

Vice Chair: M. Zubair

Output: Report

Established: 2008

Expected completion date: December 2013

Assignment: Develop a report to assist protection engineers in configuring Ethernet LANs and networking equipment when the network traffic includes critical protection messaging such as IEC 61850 GOOSE messaging. Topics include switch and router configuration, VLANs, security, priority queuing, traffic monitoring and control, and topology choices and redundancy.

The Working Group met on September 12 with 20 attendees. The Chair went over the updated version of the report. The new sections on network redundancy protocols generated a lot of discussion among the attendees, and the members agreed to add more guidelines. One attendee raised the issue that users require more guidance on how to specify, engineer and test the network to confirm network

latencies, and optimize GOOSE performance. The Chair requested the attendees to review and edit the report.

H13: Understanding Requirements and Applications of the Substation Cyber Security Standards (Joint Working Group Substations Committee C1 & PSRC H13)

Chair H13: S. Sciacca

Chair C1: Tim Tibbals

Vice Chair H13: C. Preuss

Output: Standard

Established: 2008

Expected completion date: December 2013

Assignment: Prepare a standard on “Cyber Security Requirements for Substation Automation, Protection and Control Systems.” This document provides technical requirements for substation cyber security. It presents sound engineering practices that can be applied to achieve high levels of cyber security of automation, protection and control systems independent of voltage level or criticality of cyber assets. Cyber security includes trust and assurance of data in motion, data at rest and incident response.

- A. Meeting called to order: 15 members and 23 guests. Introductions were made and IEEE Patent Policy was discussed.
- B. Announcement that the voting member roster will be pared down. People who have missed two consecutive meetings will be advised via Email that their status will be revised to Corresponding Member. If there are questions as to whether or not this applies to your specific situation, please contact Sam Sciacca or Tim Tibbals.
- C. Draft 6 is nearly complete. Document was reviewed to develop writing assignments for the few holes remaining. Our schedule of completion looks like this:
 - a. Completion of Draft – Sept 30
 - b. WG comments and ballot to bring to SC and Main PSRC Committee – Nov 30
 - c. SC and MC vote – January 2013 meeting (JTCM Memphis, TN).
 - d. Sponsor ballot opening – January 2013. The document is nearly complete....just two sections to finalize
- D. Next meeting at JTCM.

H17: Establishing links between COMTRADE, IEC 61850 and CIM

Chair: C. Brunner

Vice Chair: A. Apostolov

Output: Report

Established: 2010

Expected completion date: December 2013

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

Working Group H17 met on September 11, 2012, in Portland, OR, in single session chaired by Alex Apostolov, with 10 members and 10 guests present.

After the introduction of attendees, the participants focused on the main task of the meeting – review and discussions on the outline of the report and the contributions. The Chairman identified several members of the working group that have committed to contribute to the report, but have not submitted their contributions.

After discussions of the existing contributions it was decided that there are two potential directions of the future work:

- To expand the scope the document with other standards like COMFEDE, etc. that are required to perform disturbance or relay operation analysis
- To focus on use cases related to the engineering of disturbance and waveform recording systems

After extensive discussions it was decided that the scope of the report should be kept narrow according to option two above and if necessary a new working group should be established in the future to address the common formats requirements for relay operation and wide area disturbance analysis.

New contributions according to the above decision should be submitted by the end of November 2012.

H19: C37.118.2 Standard for Synchrophasor Data Transfer for Power Systems

Chair: Ken E. Martin

Vice Chair: Gustavo Brunello

Output: Standard

Established: 2010

Expected completion date: December 2013

Assignment: This standard defines a method for exchange of synchronized phasor measurement data between power system equipment. It specifies messaging including types, use, contents, and data formats for real-time communication between Phasor Measurement Units (PMU), Phasor Data Concentrators (PDC), and other applications.

WG H19 met on Tuesday, September 11, 2012 in a single session with 6 members and 12 guests. The quorum was not reached so the May minutes will be approved by Email.

The present status was reviewed. The standard was completed and published in December 2011. Some vendors have implemented the new config 3 message. No comments have been received indicating there are any problems with it. The WG will monitor the industry for problems and evaluate if action is needed to initiate revision to the standard.

The draft IEEE Transaction paper on the Standard was reviewed. It has been completely reviewed and edited since the May meeting. Currently transactions papers have an 8 page limit but conference papers have a 5 page hard limit. The current draft is about 6.5 pages. The WG will probably produce a transactions paper as originally planned, but may also produce a WG report. It was noted that there is significant redundancy between some sections. Jay M. and Mahendra P. will restructure the paper by transferring sections or blocks of text so that redundancy can be eliminated. Ashish K. suggested adding a system figure; Harold has redrawn the original figure from the standard and will supply that figure. Mahendra P. suggested a figure showing the data frame organization. Ken will provide such a figure. Phil B. will provide and overall read and comment.

Restructuring will be due by October 1. The restructured document will be sent to volunteers including Ashish K. others for edit. The edited document and rules governing transaction papers will be provided to the WG which will then decide on the publication options.

HTF21: Information Mapping between IEEE C37.118.2 and IEC 61850-90-5 systems

Chair: Yi Hu

Vice Chair: TBD

Output: Report

Established: September 2012

Expected completion date: December 2015

Assignment: Create a report that defines the information mapping between IEEE C37.118 and IEC 61850-90-5 system for bi-directional information exchange among such systems. (To be discussed and finalized at the first working group meeting in January 2013).

Task force HTF21 met on Monday, September 10, 2012 in Portland, OR, in single session chaired by Yi Hu with 26 people attending.

Yi Hu provided a strawman statement regarding the need for developing the mapping document. After the discussion, Task force members concluded the following:

- Agreed that there is a need to develop a mapping document for bi-directional data exchange between IEEE C37.118 and IEC 61850-90-5 systems
- The recommended approach is to develop an IEEE report to document the mapping approach

- Propose to H subcommittee to form a new working group to take the following assignment:
Create an IEEE report documenting the mapping between IEEE C37.118 and IEC 61850-90-5 standards

HTF22: Guide for Cyber Security for Protection Related Data Files

Chair: Stephen Thompson

Vice Chair: TBD

Output: Guide

Established: September 2012

Expected completion date: December 2015

Secretary: Mark Taylor

Introductions were made.

Agenda was displayed and accepted. Mark Taylor volunteered to take the minutes for the meeting.

The task force reviewed work by H18. It was noted that this report was still not available on the IEEE PSRC website. (Note: Talk to Russ Patterson to make sure H18 report gets published on the IEEE website. (Action: S.Thompson))

There was some discussion about the term "Cyber" and if having that term in the title of the work of this group would have unintended consequences. Decided that the term could be left in as it ensured that the focus was on digitally stored files and the risks associated with those and not concerned with physical files such as printed manuals or drawings.

Stephen presented the proposal for this Task Force.

The group came to a consensus that the output should be a Guide.

Task Force HTF22 recommends that a working group be established to develop an IEEE Guide on security for data files used for configuration, management and analysis of protective relaying systems. This group will continue the work started by H18 and will develop a full scope statement.

Liaison Reports

PES Substations Committee

S. Sciacca

- IEEE Central Desktop can be used by working groups working on standards, but does not replace use of 123Signup and Substations Website
- Outcome of 1711 meeting was discussed (see below)
- PSRC standards coordination is required
- 2030.4 PAR was discussed and C0 chair was added to the 2030.4 Central Desktop site to monitor what that working group is doing and inform them on what C0 does
- C0 website needs to be updated by working group chairs
- Future presentations were discussed

PES Communications Committee

S. Klein

No report

IEC TC 57 WG 10, 17, 18, and 19

C. Brunner

IEC TC57 / WG10 will meet end of October in Houston, TX, USA. WG10 has currently the following projects:

1. Finalisation of Edition 2 of IEC 61850:

Parts 5 and 10 are being circulated as FDIS; Part 3 as CDV; Part 1 is in preparation for publication as TR, Part 2 has not yet been initiated – the other parts are published.

2. Technical reports that are under preparation

- IEC 61850-90-4 – network engineering guidelines is in preparation to be published.
- IEC 61850-90-3 – using IEC 61850 for condition monitoring – and IEC 61850-90-11 – modelling of logics – are still in preparation.
- Technical reports IEC 61850-7-5 and -7-500 about the usage of the models to create application are still in preparation.
- New work for reports has been started: IEC 61850-90-12 – Wide area network engineering guidelines and IEC 61850-90-14 – Using IEC 61850 for FACTS data modelling.

3. Additional work deals with Functional testing (planned IEC TR 61850-100-1), System management and Alarm handling.

4. Preparation of a UML model of IEC 61850

Work is well progressing. Prototype of web based publication of IEC 61850 has been prepared by IEC CO. As a next step, it is planned to publish an Edition 2.1 of IEC 61850-7-3 and -7-4. These documents will be auto-generated from the UML model and will include the TISSUE resolution up to the date of publication of these parts.

IEC TC57 / WG17 will meet end of September in Zagreb, CR and is working on the following topics:

1. Technical reports that are under preparation

- IEC 61850-90-7 – Photovoltaic and inverter based systems – TR is in preparation
- IEC 61850-90-8 – use of IEC 61850 for modelling of Electrical vehicles has been circulated as a first DC. DTR is in preparation
- IEC 61850-90-6 – use of IEC 61850 for distribution automation, IEC 61850-90-9 – Storage batteries, IEC 61850-90-10 – Schedules and IEC 61850-90-15, Modelling a generic electrical view of DERs: First WG drafts are available.

2. Mapping on web services

New work has been approved to prepare a IEC 61850-8-2, mapping on web services. Currently, the requirements and candidate protocols are being identified. It is planned to publish first a TR with these results.

IEC TC57 / WG18 will meet end of September in Zagreb, CR and is working on the following topics;

1. FDIS of IEC 61850-7-410, Ed 2

2. IEC 61850-90-13 – Extension of IEC 61850 information models to also include logical nodes and data models for steam and gas turbines

3. Interoperability tests for hydro equipment based on IEC 61850 and Communication network structures in hydro power plants

IEC TC57 / WG19 with regard to IEC 61850 works on the preparation of IEC 61850-90-2 – Use of IEC 61850 for communication towards the control centre. First draft is in circulation as DC.

IEC TC57 / General:

1. The voting for IEEE C37.94 as dual logo standard has been approved; however, it will not be published as part of the IEC 61850 series, since it is a low layer protocol that can be used for IEC 61850 like other protocols that are as well not published as part of IEC 61850.

A new work to define mapping between DLSP/COSEM (IEC 62056) data and IEC 61850 I currently in circulation.

I: RELAYING PRACTICES SUBCOMMITTEE

Chair: R. Beresh

Vice Chair: J. Pond

The I Subcommittee met on September 13, 2012 with over 27 members in attendance – a quorum was achieved.

- Approved minutes of I SC meeting held in New Orleans LA, in May 2012
- Items of Interest
 - WG Chairs need to update working group members listing by October
 - WG Chairs are now asked to provide WG Meeting Agendas Seven (7) days in advance of the WG meeting.
- Working Group Chairs and Vice Chairs are required to be members of the Standards Association.
- This was Bob Beresh's last meeting as Chair of the subcommittee. Jeffrey Pond will take over as Chair in January or 2013 and Brian Mugalian will become Vice-Chair

Reports from the WG Chairs

I2: C37.100 - Terminology Review

Chair: Mal Swanson

Vice Chair: Fred Friend

Output: Definitions for C37.100 and IEEE Std. 100

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

The I2 working group, chaired by Mal Swanson, met on Wednesday, September 12, 2012 with 9 members and 3 guests, including one new member Michael Fleck.

Minutes from the May meeting in New Orleans were reviewed and approved.

Liaisons have been assigned for all working groups with a PAR to facilitate the development of new terms during the working group process. Reports were given on the status of each. Mal suggested the working group check that acronyms have a definition in the database during our review.

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.

All working group chair are reminded the database is available to them for use during their document development.

The liaison process was discussed with the working group members and IEEE staff, Erin Spiewak and Michelle Turner. Andre volunteered to create a flowchart to illustrate the process. Michelle will provide Mal the official name of the database to be used when referencing.

I4: IEC Advisory Working Group

Chair: E.A. Udren

Vice Chair: M. Yalla

Output: Comments and votes to USNC of IEC on TC 95 (Measuring Relays) Standards projects and drafts. Reports to PSRC on IEC standards development.

Meeting: WG meetings are continuing

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

The WG met on September 10, 2012 with 5 members & 3 guests. The Chair reviewed the attendees the status of documents circulated from IEC during the last cycle:

- 60255-121 CDV – *Functional standard for distance relays* – Murty Yalla, Convenor of MT 4 that writes this standard, supplied a pre-publication copy in May for the WG and for WG D21. The CDV has been published, and comments or voting advice are due to Eric by December 14.
- 60255-149 CDV – *Functional standard for distance relays* – Murty Yalla, Convenor of MT 4 that writes this standard, supplied a pre-publication copy in May for the WG. The CDV has been published, and comments or voting advice are due to Eric by October 7.

- IEC 60255-187-1 - *Functional requirements for biased (percentage) differential relays* i This standard, still in preliminary form, covers differential protection of generators, motors, transformers and reactors. The first CD has not yet been published.
- 60255-27 Ed. 2 CDV – *Product Safety for Relays* - Voting advice and document comments due to Eric December 7. Comments of other national committees on the last CD are available for review. Participants wishing to review these drafts should contact the Chair for a copy and a standard comment form.

The IEC TC95 plenary meeting is scheduled for Tuesday, Nov 13, 2012 and MT4 will be meeting from Wednesday Nov 14 to Friday Nov 16, 2012 in Beijing, China. Murty Yalla, Deputy Technical Advisor to USNC, will represent the US.

With regard to TC 57, Vigorous IEC 61850 development activities by WG 10, 17, 18, and 19 are in Christoph Brunner's Liaison Report to SC H.

A notable development is that IEEE C37.94, N Times 64 Kilobit Per Second Optical Fiber Interfaces Between Teleprotection and Multiplexer Equipment, has been adopted by IEC TC 57 as a dual-logo standard, labeled IEC 61850-85-1.

I5 Schematic Representation of Power System Relaying

Chair: Kevin Donahoe

Vice Chair: Rich Young

Output: Report

Expected completion date: TBD

Assignment: Report on common practices in the representation of protection and control relaying. The report will identify methodology behind these practices. Present issues raised by the integration of microprocessor relays and the internal logic and external communication configurations. Detail approaches to these issues.

Meeting #14, Tuesday, September 11, 2012, 1:30 pm, Portland, OR

Kevin Donahoe, chair, Rich Young, vice chair

Assignment: Report on common practices in the representation of protection and control relaying. The report will identify methodology behind these practices, present issues raised by the integration of microprocessor relays, and the internal logic, external communication configurations, and detailed approaches to these issues.

The Working Group met at 1:30 with 10 members and 8 guests attending.

Since Kevin Donahoe could not attend, vice chair Rich Young opened the meeting with introductions, and reviewed our assignment.

The chair and vice-chair did not have time to disseminate minutes from the previous meeting due to time constraints.

Adi Mulawarman presented his writing assignment on logic diagrams. There are many different ways to depict logic. Discussion was held on whether to include all of the material, and it was decided to leave them all in for the time being.

Discussion was held on communication block diagrams. Many of the figures are illegible due to being largely reduced from their original size. We will have to investigate ways to present the material in a more legible manner.

The question was raised whether wiring diagrams should be included since the title of the report mentions schematic representation. We will leave them in for the time being.

We still need Conclusions and References sections. Other than those, the material is complete. The members are asked to read through the report in its entirety and provide comments on logical flow, and whether there are any duplications or omissions. Comments are requested by December 1. We will try to assemble a final draft for the January, 2013 meeting, and complete the report before the May, 2013 meeting.

Rich Young will look into ways to get the Word version of the report to the members. It is presently 30 MB, which is too large for email. The pdf version will be emailed to the members.

I7: Revision of C37.103 Guide for Differential and Polarizing Circuit Testing

Chair: Gary Kobet

Vice Chair: Alex Lee

Output: IEEE Guide
Established: May 2012
Expected completion date: 2016

Assignment: Revise and update the IEEE Guide C37.103 – Guide for Differential and Polarizing Circuit Testing

Working Group 17 held its meeting in a single session on Monday, September 10, 2012.

There were 6 members present and a quorum was reached. 3 guests attended the meeting. Working group membership stands at 10.

The IEEE patent requirement slides were presented, and attendees were given the opportunity to identify any known patent claims.

This was the second meeting for this working group.

Chair Kobet announced the group will be using the Central Desktop application provided by IEEE-SA.

E-mail invitations have been sent to each WG member.

Jason Buneo and Gary Kobet made comments regarding their review of the document. Both will write up their comments and submit to the group.

Particular comments worth noting include:

- Several sections need figures (e.g., 5.3.2 Current shorting switch, 5.4.1 Transformer Load Box), and all figures will require updating.
- Some discussion was held regarding the use of 120V lamp bulbs. Consensus for the moment is that this material should be retained as a viable low-cost option for those not able to afford the more expensive test sets.
- The year following reference to IEEE documents should be removed throughout.
- Some sections (7.3, 9.3) on in-service testing recommend/allow disabling protection during the tests. Consensus of the group was that we should consider removing this wording in favor of stressing the importance of keeping protection in-service and available for tripping at all times.
- A sample calculation to illustrate how to determine the required kVA rating for primary injection test equipment should be added. Alex Lee offered to provide a spreadsheet as a starting point.
- Consider adding a section mentioning preparatory tests on voltage transformers to be used for polarizing sources (as the guide does for current transformers).
- A new section on transformer ground differential (restricted earth fault) will be added by Gary Kobet.

Chair Kobet will create draft zero (0) by October 31, 2012 and post to the Central Desktop area for the C37.103 Working Group.

The Working Group will review this document and be prepared to discuss at the January 2013 meeting.

18: Revision of C57.13.3 - Guide for Grounding of Instrument Transformer Secondary Circuits and Cases

Chair: Brian Mugalian

Vice-Chair: Bruce Magruder

Established: 2009

Output: Revision of IEEE/ANSI C57.13.3-2005

Expected Completion Date: 2013

Assignment: Revision of C57.13.3 - Guide for Grounding of Instrument Transformer Secondary Circuits and Cases

Working Group 18, Revision of C57.13.3 - Guide for Grounding of Instrument Transformer Secondary Circuits and Cases, was held in Executive, Hilton Portland and Executive Tower, Portland OR on September 11, 2012. Twelve members and six guests were present.

The working group continued to edit Draft 3 of the Guide. Sections 6 and 8 were discussed. Section 6 adds a new detail on "filter" grounding, where electronic devices have surge, case, and EMI filter grounding terminals. Bruce Magruder submitted CT drawings for Annex A. Del Weers will review and update Annex A for the next version of the draft. Brian Mugalian will ask Moh Sachdev to provide a write

up on utility practice regarding groups responsible for grounding in the substation yard versus in the control house. The GE 469 relay manual has examples of grounding which will be reviewed by Bruce Magruder.

The working group will set up a public and private collaboration space in Central Desktop to check-out/check-in the draft for editing. Brian Mugalian has contacted IEEE-SA. Each working group member will be contacted and will need to create a member profile in order to gain access to the public and private sites.

Conference calls will be held in November to review the draft and get approval from the working group to request from the Relaying Practices Subcommittee permission to form an IEEE-SA balloting body. The PAR expires at the end of 2013. An invitation to ballot would be submitted after the January meeting, with receipt of ballots/comments before the May 2013 meeting.

I9: Reaffirmation of C57.13.1 Guide for Field Testing of Relaying Current Transformers

Chair: Brian Mugalian

Vice Chair: Bruce Magruder

Output: Reaffirmation and review of comments received on IEEE C57.13.1

Assignment: Reaffirmation of IEEE C57.13.1 to determine whether a revision is needed

Working group I9, Reaffirmation of C57.13.1 - Guide for Field Testing of Relaying Current Transformers, was held in Executive, Hilton Portland and Executive Tower, Portland OR on September 11, 2012. Seven members and four guests were present.

The Reaffirmation was approved by IEEE-SA on March 29, 2012. There were 2 negative ballots and 32 comments received from the balloting body. The attendees reviewed the comments and determined which require further study. Assignments were made and a conference call was held on August 29, 2012.

The working group agreed that there is enough new material, test equipment, methods, and technology on field testing of relaying current transformers that a revision to the Guide would be a benefit to users.

The working group will inform the Relaying Practices Subcommittee that the working group assignment has been completed and that the group should disband. And, request that a Task Force should be formed to investigate further and determine whether a revision to the Guide is needed. The initial perception is that there are new items that would benefit the document. The Task Force has been assigned ITF23, and would propose the scope, purpose, and PAR of the revision of the Guide.

I10: Revision of C37.98 Standard for Seismic Testing of Relays

Chair: Marie Nemier/Suresh Channarasappa

Vice Chair: Munnu Bajpai

Suresh Channarasappa – Co –Chair SC-2

Output: Revision of Standard C37.98

Assignment: Revise and update C37.98

The WG did not meet. Standard is going to ballot in October. A PAR extension will be filed.

I11: PC37.241 - Guide for Application of Optical Current Transformers for Protective Relaying

Chair: Harland Gilleland

Vice Chair: Bruce Pickett

Established: March 25, 2010

Output: Guide PAR PC37.241

Expected Completion Date: December 31, 2014

Assignment: Develop Guide for “Application of Optical Instrument Transformers for Protective Relaying”

Current draft= rev-1.6

Following introductions, the meeting was opened with a review of the IEEE Copyright and WG Guidelines slides. There were 8 members and 1 guests present.

Bruce (Harley was unable to make this meeting) discussed the Agenda, and the consolidation of the standalone sections of the Guide into Draft one by the task team lead by Farnish. Farnish led a review and discussion and updated the current Draft (1.6/ 9-12-12 version) of the document.

Discussions included:

- Update and Status of the 11 Sections for the Guide:
- Strategy for the consolidation and review process:
 - The WG task force members will review – provide feedback – and make needed corrections in concert with the Task Team and section team leaders
 - All members will have an opportunity to review the material
 - This process will be repeated as needed

WG12: Quality and Control for Protection & Control Design.

Chair: Andre Uribe

Vice Chair: Mal Swanson

Output: Report

Assignment: “To develop a special report outlining the best practices of quality control for protection and control design drawing packages from conception to final “as-built”.

The Working Group I-12 met on Tuesday, September 11, 2012, Portland, OR in single session chaired by Andre Uribe with a total of 24 attendees (6 members and 18 guests).

May meeting minutes were reviewed and approved.

In our meeting, the group covered the following:

1. Discussed the purpose of the report and the targeted audience
2. Reviewed each section for the report
3. Had several quorums for changes and additions
4. Announced a new member, Michael Wright
5. Assigned 14 new task to various members and guests:

Michael Wright:	Write up for Introduction section
Don Ware:	Define the phrase “as-built”
Dolly Villasmil:	Comment on section “Communication, Accountability, Respect”
Jay Sperl:	TBD
Duane Buchanan:	Write up on NERC Compliance section
Wayne Harman:	Write up on Manufactures Rep section
Don Ware:	Write up support for Wayne on Manufactures rep
Cathy Dalton:	Comment on Project Constraint and update
Joe Xayier:	Review and comment on defining schedule and include charts
Joe Gonzales:	Review and comment on Unrealistic Schedule section
Don Feltz:	Review and comment on Design Standards to include one line diagrams and add write up on schedule improvement
George Moskos:	Update Site Visit Section and rename meeting titles and add operations manager as attendee to meetings. Write up on taking photos during site visit
Andre Uribe	Move Industry Standards & Mfgr Recommendation to section 6
Mike Wright	Write up on Check List section
Andre Uribe	Combine section “Check List” and “QC”
Andre Uribe	Review “As-built” section and change the pencil color piece

I20: Revision of C37.90.1 - IEEE Standard for Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus

Chair: Tom Beckwith

Vice Chair: Jeff Burnworth

Output: Revision of C37.90.1 SWC Tests Standard

Expected Completion Date: September, 2010 (ready for ballot)

Assignment: To revise IEEE Std C37.90.1™-2002

The WG did not meet. The Standard was approved. Recommend disbanding working group.

I21: Analysis of IED System Waveforms and Event Data

Chair: Jerry Jodice

Vice Chair: George Moskos and Alex Lee

Output: Report

Established: 2012

Expected Completion Date:

Assignment: Prepare a report that will define a process for identifying and analyzing a fault incident. The process will include data collection, analyzing techniques and methods of reporting.

Working Group I21, met in double session on Sep 11, 2012.

There were 12 Members and 15 Guests in attendance.

Session 1, consisted of 4 presentations.

- A. Amir Maki's Presentation "CT Saturation".
- B. Ken Behrendt "Transformer Inrush".
- C. Karl Zimmerman "CCVT Transient".
- D. Dan Sabin "Power Quality Meters".

The four presenters presented characterized signature waveforms for Transformer Inrush, CT saturation, and CCVT Transients. Previous presentations included the following topics: the use of event records to verify protective relaying operations, National Grids event analysis process and data requirements, and Oncon's event and fault analysis process.

Dan Sabin presented on the use of Power Quality Meters for Fault Analysis and Fault Location. The working group agreed to include this information in this report.

The working group writing assignments will follow the format developed by Ken Behrendt. A table has been developed which lists the working group writing assignments. All writing assignments need to be submitted by October 31, 2012.

Reports from the TF Chairs

ITF22 End of Life Assessment of P&C devices

Chair: TBD

Vice-Chair: TBD

The need for some guidance in determining end of life criteria for protection and control devices seems to be needful at this time. The TF attendees agreed that there is a need for a formal document and will proceed to work on an assignment to that end during the January 2013 meeting. A TF chair will also be nominated at that time.

Liaison Reports

Instrument Transformer Sub Committee, Liaison Report

The Instrument transformer Committee met in Nashville March/2012. There are presently 2 WGs. One WG is writing a standard for CTs with mA secondaries. The second WG is reviewing a number of important changes to C57.13. Integration of C57.13.5 into C57.13 has run into major resistance. Consensus is to create a second class of instrument transformers (Class II). This class will incorporate the additional C57.13.5 extra HV tests etc. Class I would be the default class if Class II is not specified. An Appendix will include a large section on bushing CTs.

Coordination Reports

None

Old Business

None

New Business

Memberships – Suresh Channarasappa newest member of I Subcommittee.

Discussion of NERC Relay Committee Procedure for Commissioning of Protection Schemes letter.

NERC is asking if the PSRC would be interested in developing a guide for commissioning of Protection Systems. The general consensus of the subcommittee is that this is something that we are interested in developing. Phil Tatro of NERC will provide updates on the results of the NERC System Protection Committee.

The I9 working group reaffirmation of C57.13.1 Guide for Field Testing of Relaying Current Transformers group recommended a task force be formed to explore a revision C57.13.1 Guide for Field Testing of Relaying Current Transformers. The subcommittee approved forming ITF23. A Chair of the task force is to be determined.

Amir Makki recommended a task force be formed to investigate the use of Hall effect sensors for measuring CT performance and disturbance monitoring. During the discussion a recommendation to form a task force to investigate the use of split-core CTs for sensing and monitoring was made. The subcommittee approved forming task force ITF24 to investigate the use of Hall Effect Sensors and Split-Core CTs. A Chair of the task force is to be determined.

Working Group I9 Reaffirmation of C57.13.1 Guide for Field Testing of Relaying Current Transformers was disbanded.

Working Group I20 Revision of C37.90.1 - IEEE Standard for Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus was disbanded.

J: ROTATING MACHINERY PROTECTION SUBCOMMITTEE

Chair: M. Yalla

Vice Chair: M. Reichard

Scope: Evaluate and report on protective relaying concepts and practices applicable to generators, motors, synchronous condensers, associated auxiliary systems, and performance of plant protective systems. Develop and maintain related relaying standards.

The J Subcommittee met on Wednesday, September 12, 2012 with 16 members (achieving quorum 16/28) and 27 guests. There was a call for the approval of the minutes of the May 2012 meeting in New Orleans. These minutes were approved unanimously by the subcommittee members.

Reports from the WG Chairs

J2: Protection Considerations for Combustion Gas Turbine Static Starting

Chair: Mike Reichard

Vice Chair: Zeeky Bukhala

Established: 2005

Output: Report to the Subcommittee

Expected Completion: 2009

Status: Draft 2b (Final)

Assignment: Deliver a paper or report on special protection requirements on generators employing load commutating inverter (LCI) static starting.

The Working group did not meet at this meeting. The report is published on the PSRC website. Mike Reichard will contact Dale Finney regarding progress on the Transaction paper. No meeting for the next session.

J3: Power Plant and Transmission System Protection Coordination

Chair: Phil Waudby

Vice Chair: Sungsoo Kim

Established: 2010

Output: TBD

Expected Completion: TBD

Status: 7th Meeting

Assignment: [Proposed] The J3 Working Group is to provide a report containing recommendations to the J Subcommittee on coordination issues and other relevant matters gleaned from the NERC Technical Reference Document - Power Plant and Transmission System Protection Coordination to be used as a feeder material and technical additions for consideration in the next revisions of C37.101, C37.102, and C37.106. The WG will also provide an on-going interface with NERC for Technical Matters Pertaining to Generator and Power Plant Protection.

The WG has completed its assignment. The report is approved, will be transmitted from the PSRC Officers to NERC. No meeting for the next session.

J5: Application of Out-of-Step Protection Schemes for Generators

Chair: Sudhir Thakur
Vice Chair: Mukesh Nagpal
Established: 2011
Output: Report
Expected Completion: TBD
Status: Third Meeting

Assignment: Produce a summary and full report to the "J" Subcommittee explaining the various schemes and setting guidelines in use for Out-of-Step protection for AC generators. The report (summary) should be in the format that could be used as feeder material into the next revision of C37.102-IEEE Guide for AC Generator Protection.

The Working Group met for a single session with 11 members and 11 guests. Murty Yalla served as acting Chair in the absence of Sudhir Thakur and Chris Ruckman served as acting Vice Chair.

The writing assignment from Eli Pajuelo on Loss of Field Protection was reviewed to determine appropriateness for this paper. Eli was unable to attend the meeting and Chair reviewed the submitted material with the working group. Point was made that this section should focus on the limitations of using LOF relaying for OOS protection and advocating the use of dedicated OOS protection.

Writing assignment from Steve Turner on single blinder OOS protection was discussed. Point was made that Z3 should be the "trip on Mho exit" point instead of as shown on Figure X. Comment was made that breaker duty needs to be checked regardless of the breaker interrupting media (oil or SF6). It was discussed that 21 (typically only zone 1) should have OOS blocking or time delay to avoid breaker flashover. Noted a font change in the document on page 2 and that there is a discrepancy in the blinder A & B labeling between Figure X and Figure Y.

Murty Yalla asked for working group members to volunteer for the unassigned sections. Gene Henneberg volunteered for the Appendix. Phil Tatro volunteered for the Stability Study section.

It was agreed that paper should include some discussion on the pole slip counter. Paper should also discuss the protection philosophy of OOS blocking in close-in substations and the impacts of system swings just outside the GSU transformer on the generator. The paper needs to address the coordination between the generation owner and the transmission owner to provide any necessary OOS protection in the transmission system.

It was noted that only the schemes that have advantages or schemes that are commercially available should be discussed in the paper.

Acting chair asked that the appendix set the OOS per the C37.102 graphical method and then set the OOS based on the stability study guidelines presented in the paper and then show the differences between the two sets of settings.

The next meeting will require double session with an LCD projector for 50 people. It is requested that the schedule conflict between J5 and K4 meetings be avoided. It will allow M. Nagpal who is Vice Chair of J5 and Chair of K4 to attend both meetings.

J6: Protection issues Related to Pumped Storage Hydro Units

Chair: Joe Uchiyama
Vice Chair: TBD
Established: 2009
Output: Transactions Paper
Expected Completion: TBD
Status: Seventh Meeting

Assignment: To review and summarize the trends of the last thirty-five (35) years of Pumped Storage unit protection since PSRC presented the summary report in May/June 1975. The WG review is focused on: (1) Old protection/control, (2) New protection/control, (3) New experiences during protection rehabilitation and (3) any significant issues/concerns. Evaluate and report on protective relaying concepts and practices applicable to a combination of generator and motor, associated auxiliary systems, and performance of plant protective systems. Summarize the trend of Pump-Storage motor and generator protection for the last thirty-five (35) years of industrial practices.

1. Members introduced themselves.
2. Joe Uchiyama welcomed to this WG and briefly explained the status of the WG. He reported the document was approved by PSRC officers and ready to send out for the survey. He had distributed meeting agenda and the final version of draft form.
3. WG chairman had stated the remaining items are; (1) Contact persons for six utilities, and (2) Usage of some survey programs (Murty Yalla brought out by E-mail a couple month ago). Chairman will contact Murty for this.
4. Chairman stated to review the consolidate Survey Form which was balloted by PSRC officers. We met the Quorum with 100% responses. (Approved with minor comments).
5. WG discussed/reviewed the draft of survey form for the remaining times. One of the attendee brought new installations with the valuable experiences. Some of those experiences are not in the parts of the survey questionnaires; WG will provide a section for those experiences in the report.

Next meeting will be 20 people and one session with computer projector.

J7: Avoiding Unwanted Reclosing on Rotating Apparatus

Chair: Mike Reichard

Vice Chair: Steve Conrad

Established: 2011

Output: Report to Subcommittee

Status: Third Meeting – Developing outline

Assignment: To review and provide comment on the protection and control vulnerability known as “Aurora”

Steve Conrad chaired the meeting and recognized Mike Reichard for his absence and service to the country while attending USAF Reserve Training during the PSRC meeting week.

The WG group met in Portland, OR with 5 Members and 20 Guests. A presentation on the test performed and the issues resulting from the test was made to the WG by Jeff Roberts. Also participating in the presentation were Ralph Folkers and Tim Roxey.

After some editing the presentation material will be sent to the Vice chair (Steve Conrad) and made available to the WG members.

Jeff Roberts expressed the desire to establish a function number to indicate the protective function of the mitigation logic protection to prevent the undesired closing onto rotating apparatus. He suggested a possible function number of 25C.

Gene Henneberg indicated at the May meeting that he had done some evaluations and would like to discuss the findings at the upcoming September meeting. Since the presentation consumed the allotted time this will be taken up at the January meeting in Memphis, TN.

The WG will meet in Memphis in January 2013, with the need for a single session, computer projector and seating for 40 people.

J9: Motor Bus Transfer

Chair: Jon Gardell

Vice Chair: Dale Fredrickson

Established: 2006

Output: Working group report
Expected Completion: 2011
Status: Draft 5.0

Assignment: Investigate protection and control issues and phenomena impacting the effectiveness of safely transferring buses primarily consisting of motors from one power source to another source.

1. The Working Group did not meet during this PSRC Committee meeting.
2. The Working Group has completed its assignment with the approval of the report by the IEEE PSRC Officers
3. The WG report is planned to be presented at the Main Committee meeting on Thursday.
4. There is no meeting for the next session.

J10: PC 37.96 Guide for AC Motor Protection

Chair: Prem Kumar
Vice Chair: Dale Finney
Established: 2007
Output: Guide Revision C37.96
Expected Completion: 2012
Status: Draft 10.0

Assignment: Review and revise C37.96-2000 as needed.

The WG did not meet in Portland. Final approved draft has been submitted to RevCom. Expect to be published in March 2013. No meeting is planned for the next session.

Other Reports:

C17: Fault current contribution from wind farm plants

Report given by Gene Henneberg. New material added to draft concerning expected output from types 3 and 4 machines

Presentation by CFE, Mexico

Presentation title: Analysis of the behavior of protection scheme for Stator Ground Fault due to Overvoltage of the Fundamental Neutral Component by means of Electromagnetic Transient Simulation

Authors: **Jorge Félix (presenter)**, **Eduardo Reyes (presentation assistance)**, Ramon Sandoval, Fernando Morales, Sergio Melendez

Date and Time: Sept 11, 2012, 04:30 PM to 05:45 PM.

The presentation was very well attended with an attendance of 45 people. The J subcommittee chair recognized the presenters and their contributions.

Liaison Reports

Electric Machinery Committee (EMC)

C. J. Mozina

The Committee met at PES General Meeting in San Diego, CA--- July 22-26, 2012. The minutes for this meeting are not as yet posted on the EMC web site. The last minutes posted on the EMC web site were the 2010 meeting which have been previously reported.

IAS I&CPS Committee

C. J. Mozina

This report will be given at the main PSRC committee meeting. The written report is published under main committee liaison reports.

Nuclear 1E WG

P. Kumar

IEEE 741 protection of 1E systems want to revise guidelines for the degraded voltage settings. It is presently shown as an annex in 741. They want to have a new standard for which the PAR has been submitted that will be called voltage monitoring that will include revised guidelines for degraded voltage settings and also they will remove existing guidelines from the IEEE 741.

NERC (related to rotating machinery)

J. Uchiyama

SPCS support for many NERC Activities

- a. PRC Standards under development.-
 - PRC-001-2 (Generator & Transmission protection coordination) will be replaced with PRC-027, DT is working on this standard for the last two years.
 - PRC-005-2 (Protection system maintenance & Testing)
Just finished Official comment period: – (a) 12 years if relays are monitoring. (b) 6 years for microprocessor relay(s), (c) maintenance of Batteries, etc.
 - PRC-023-2 (Line relay Loadability)- Utilities just went-through this process
 - PRC-025-1 (Generator Relay Loadability)
Devices 21, 51V, 51R, 51T-Basis of Name Plate Rate versus Reporting Rate
- b. Special Protection Review – Misoperation Report template was finalized. – Generator Misoperation will be reported by HV side GSU.
- c. SPS & RAS were consolidated one – “Gen-Drop Scheme” is only related to J-Subcommittee
- d. There is an issue/concern for “Reclosing” document. Reclosing relating to this group is only near Power Plants for this group (Shaft fatigue).

Next Meeting: October in Chicago, IL.

Coordination Reports

None

Old Business

The reaffirmation ballot for C37.102 Guide for AC Generator protection has been completed. It is on the agenda for Dec 14th, 2012 Rev Com meeting.

New Business

1. There was a call for motion to set up a task force to prepare a report to the subcommittee based on the work done by CFE (see other reports section). The motion was seconded and approved with 15 of the 16 members voting yes. A new task force (JTF8) is set up which will be chaired by Russ Patterson. The J subcommittee chair will write a letter to the CFE management to sponsor attendance of engineers from CFE, Mexico.
2. J subcommittee received a request from Chris Ruckman to set up a task force to prepare a report to the subcommittee on power plant protection issues associated with black starting of generators. There was a motion to set up the task force and it was seconded. The motion was approved by 15 of the 16 members. A task force (JTF9) will be set up which will be chaired by Chris Ruckman.
3. Charlie Henville proposed that there should be a collaboration work between J subcommittee, *Excitation System Subcommittee of the Power Generation Committee* and Power Systems Dynamic Performance committee. There was a call for motion with a second to set up a task force to look into the coordination between excitation controls and generator protection settings. WG chair will be announced soon.

A suggested assignment for the Task Force (JTF10) is: Investigate the modeling of out of step and Loss of Field conditions and the coordination of generator excitation control systems with protection systems with the help of the Excitation Controls Subcommittee of the Energy Development and Generation Committee and the Power Systems Dynamic Performance Committee.

The meeting was adjourned

K: SUBSTATION PROTECTION SUBCOMMITTEE

Chair: P.G. Mysore
Vice Chair: M. J. Thompson

The K-Subcommittee met on Wednesday, September 12, 2012 in Portland, OR, with 19 members and 19 guests in attendance. A quorum was achieved to approve the minutes of the May 2012 subcommittee meeting.

Reports from the WG Chairs

K1: GUIDE FOR THE APPLICATION OF PROTECTIVE RELAYING FOR PHASE SHIFTING TRANSFORMERS.

Chair: Arvind Chaudhary
Vice Chair: Lubomir Sevov
Established: Sept. 2011
Output: Guide for the Application of Protective Relaying for Phase Shifting Transformers
Expected Completion Date: Sept.2015

Assignment: To write a guide for the application of Protective Relaying for Phase Shifting Transformers (PSTs). The protection methods for different types of PST and operating conditions of PSTs will be reviewed. Representation of PST models to determine short circuit currents for relaying considerations will be considered. Protection CT sizing and location issues will be considered. Relay application and setting examples will be provided.

The K1 working group met in a single session. Eight members and two guests were presented. Quorum was established at the beginning of the meeting followed by approval of the minutes from the May meeting in New Orleans, La

Michael Thompson led the discussion on the protection section of C57.135. It is hoped that C37.245 will provide guidance to protection engineers in protecting PSTs.

The IEEE patent slides were shown and discussed.

Tom Wiedman was invited to be a corresponding member of WG K1. Tom volunteered to submit a write up on different types of PSTs that he had experience with. This write up would include CT locations and the types of protections used.

Joe Mooney requested that Short Circuit calculation be added. Charlie Henville suggested that PST modeling for short circuit calculation be added.

Joe stated that CT specification for PST and PST locations could be added as chapter in the guide.

Charlie suggested that test data for modeling and protection should be added in the guide to serve as requirements to the PST manufacturers.

Tom mentioned inclusion of commissioning tests for phase shift verification and short circuit tests.

Don Feltz noted that a discussion of NERC redundancy considerations on PST protection be added.

Charlie suggested reference to PSRC Report on redundancy.

Assignments:

- Arvind and Lubo to provide Draft Outline to WG members for further comments by Sept. 27th, 2012.
- Tom to provide a write up on CT locations and protections for some 7 types of PST.
- Paul Elkin to provide a write up on his experience on PST protection
- Charlie volunteered to provide a write up on PST applications.
- Joe will work on PST types following the ones from the C57.135 guide.

K3: REDUCING OUTAGES IN TRANSMISSION SUBSTATIONS
(subtitle: Reducing Outages Through Improved Protection, Monitoring, Diagnostics, And Auto restoration In Transmission Substations)

Chair: Bruce Pickett

Vice Chair: Paul Elkin

Established: Sept. 2010.

Output: Papers – 1. Full Paper Report to the Sub Committee and Main Committee, and 2. Summary Transactions Paper

Draft 5; Transactions Summary paper 0

Expected Completion date: 2013

Assignment: To prepare a paper or a report on protection methods that reduces outage durations in substations with auto-restoration and communication techniques.

Meeting was called to order Sept 11, 2012 with 6 members and 3 guests

Introductions were done and previous minutes were discussed.

We reviewed draft-4.5 of the paper, and made additional changes and writing assignments.

K4: (PC 37.95.2002): GUIDE FOR PROTECTION CONSUMER UTILITY INTERFACE

Chairman: Mukesh Nagpal

Vice Chair: Chuck Mozina

Established: 2008

Output: Guide Revision

Draft 9

Expected Completion Date: 2012

Assignment: To revise C37.95-2002 (R2007) – Guide for Protective relaying of Utility-Consumer Interconnections

The working group met in a double session on Monday Sept.10. In the absence of the chair the WG meeting was chaired by the Vice Chair Chuck Mozina. A total of 9 members and 13 guests were present. A quorum was not present which has been a frequent occurrence. The Chair has agreed to review the membership list and contact members of the WG who are not active and have not contributed to the document to see if they wish to be removed from the WG to decrease the WG size so that a quorum could be more easily reached at future meetings. The PAR expiration date is the end of 2013. The Chair provided draft 9 of the document which reflects changes resulting from assignments made since the last meeting. This draft was reviewed up to clause 5.1.2 and agreed upon changes are incorporated in draft 9A developed during the meeting. To accelerate the review process the WG suggested that webinar(s) be use to complete the detailed editorial review of the document and that a WG ballot draft be prepared and sent out prior to the Jan. 2013 meeting. A suggested schedule was developed to meet this objective and is outlined below:

- Compete review of entire document by end of Oct. 2012
- Webinar(s) in mid- Nov to complete document review
- Send out WG ballot in early Dec. 2013 with responses by Jan.1, 2013
- Discuss ballot results at Jan. 2013 meeting

Review of progress on past assignment.

Figures 1-9 – Steve Conrad provided Visio drawings at the meeting for Fig. 1-9 which incorporated changes discussed at the May '12 meeting. All drawings in the document have been re-drawn in the Visio format.

Ken Behrendt reviewed the document up to clause 5.2.4.1 for consistency.

The bulk of the WG meeting was devoted to reviewing the changes to figures and reviewing word changes in the text of Draft 9 of the standard. Changes are incorporated in draft 9A developed at the meeting.

Assignments:

- The Chair will review the membership list and contact members of the WG who have not been active and have not contributed to the document to determine if they wished to be removed from the WG roster.
- Steve Conrad agreed to be responsible for changes to the drawings in the document resulting from a review of the document.
- Ken Behrendt and Chuck Mozina agreed to review the remaining sections of the document for consistency by Oct 31, 2012.
- Roger Whittaker from the Terminology Usage Review WG will review Definition and Bibliography Section of the document.
- The Chair will schedule WG webinar(s) to complete the review of the document by the end of Nov. 2012.
- Two member of the standards board were present for part of the meeting and commented that when citing reference standards the reaffirmation date should not be used only the date of the approved documented is necessary.

K5: (PC 37.119.2005): IEEE Guide for Breaker Failure Protection of Power Circuit Breakers**Chairman: Roger Whittaker****Vice Chair: Adi Mulawarman****Established: 2012****Output: Revised C37.119-2005 – IEEE Guide for Breaker Failure Protection of Power Circuit Breakers****Draft : 1.0****Expected Completion Date: To Be Determined.**

Assignment: To revise and update C37.119-2005 – IEEE Guide for Breaker Failure Protection of Power Circuit Breakers.

The working group met on Tuesday, September 11th 2012. We had 28 attendees with 14 members and 14 guests present. The working group has 33 members so far.

We briefly checked with working group members about their assignments and if they have any questions or major concerns. Some WG members have submitted their assignments. We did not go into the detail of the content of their contributions/additions/findings. This perhaps will be done at the January 2013 meeting.

Roger revisited the possible inclusion of failure to close a generator breaker into the scope. However, the group is not sure if we should be including this in C37.119. Some say yes, some say no. Roger W. will ask subcommittee J about including the topic of failure to close when C37.102 is up for revision. The K5 working group decided to continue their present assignments. Roger will update the group at the January meeting.

Per Erin Spiewak of IEEE-SA, it is possible to change the PAR to include the failure to close scope in C37.119. This has not been decided.

Team lead is assigned for each section being reviewed. These are Mike Fleck, definitions; Mike Thompson, Need for BFP; Jeff Barsch, Backup Protection, Brian Boyson, BF Modes; Alla Deronja, BFP Schemes, Alla Deronja, BF Design Considerations; Ian Tualla, Settings Factors; Charlie Sufana, Communications based schemes; Don Ware, BFR testing, Joe Uchiyama, Appendix- BF setting Example. They are tasked to put together contributions of other members in that section before submitting to the chair and vice-chair.

Team leads for new proposed sections include: Sam Sambasivan, BFP of series connected breakers; Mike Thompson, Generator BF to close; Phil Zinc, Apply BFP to redundant primary; Aaron Martin, Breaker Differential; Roger Whittaker, Flashover; and Don Ware, Column Ground Protection.

The chair and vice chair will put the contributions received so far and anything in between today and the next meeting in January so everyone can review them before January 2013 meeting.

Eric Udren will supply information from NERC to us regarding BFP schemes which rely on 52 a switch. Mike Jensen from PG&E shared an event related to failed breaker at one of the pump storage facilities. Here is a summary from him.

Listed below is the Sequence of Events for the failed breaker at one of our pump storage facilities. It should be noted this failure was from a manual open command.

Summary

Unit-1 (390MVA pump/gen) was in pump mode when a shutdown command was executed, 230kV CB 270 (Unit-1 breaker) failed to open and initiated breaker fail (via loss of field protection). The CB 270 breaker failure relay initiated DTT to the remote station (STA X) and de-energized the 230kV generation tie line by tripping the STA X breakers (CB 332, and CB 432). One of the STA X breakers performed a line test (10 sec) and energized the line to the still closed CB 270 and re-energized Unit-1. Since Unit-1 was still in pump mode and spinning down this turned it into an induction machine. Unit-1 was eventually de-energized when the 230kV line was manually opened at STA X (14 minutes later). Unit-1 suffered major damage to the rotor, stator, and exciter.

The 230kV breaker failed when the main operating arm sheared thus preventing the main interrupting contacts to open, however the auxiliary CB indicating contacts opened providing a false breaker open indication to the operators and the Unit-1 excitation system which inserted field decay resistors removing voltage from the field. When Unit-1 was re-energized the field resistors were energized past their short term rating and caught fire resulting in major exciter damage.

A word document version of the existing standard has been posted in the Mentor website. It is available for member of the Working Group. We agreed to continue to post the documents to the mentor site for access. For those reviewers that do not have access, the vice-char will Email them copies of the document. These copies and also the posted copy will have "track changes" feature enabled.

The chair asks that assignments be completed by the January 2013 meeting.

K6: SUDDEN PRESSURE PROTECTION FOR TRANSFORMERS

Chair: Randy Crellin

Vice Chair: Don Lukach

Established: May 2005

Output: Report

Expected Completion Date: January 2013

Draft 2.0

Assignment: To complete a technical report to the Substation Protection subcommittee on the application of sudden pressure relaying in power transformers.

The working group met on Wednesday morning, September 12th, in a single session with 10 members and 6 guests. One of the guests, Mark Schroeder, joined the working group. The working group currently has 16 members.

After introductions, the working group reviewed Gene Henneberg's draft #2 revisions that were identified during the May meeting in New Orleans. After this review, we made the following five writing assignments:

- Write the Introduction – Pat Carroll
- Improve document figures – Steve Conrad
- Investigate and expand section on uP/transducer based device – Don Ware
- Expand earthquake related section – Mark Schroeder (new member)
- Write the Conclusion – Randy Crellin

All writing assignments are due by the end of October. Draft 3 of the report will be sent to the working group by the end of November for review and discussions during our January meeting in Memphis.

There was additional general discussion related to negative sequence differential relaying and the use of SPR devices in seismic areas.

K8: GUIDE FOR THE PROTECTION OF SHUNT CAPACITORS

Chair: Pratap Mysore

Vice Chair: Ilia Voloh

Established, 2006

Output: Revision of IEEE C37.99-2000

Expected Completion date: 2011

Status: Draft 7.1 –completed balloting and recirculation –submitted to REVCOM

Assignment: Revise and update C37.99-2000 “Guide for the Protection of Shunt Capacitor Banks.”

The WG K8 did not meet this time. The draft version 7.1 of the guide was recirculated after addressing all the comments received during the balloting process. The draft was submitted to REVCOM for approval and to the editorial staff for getting the document ready for publication after approval from the REVCOM.

K10: SCC21 DISTRIBUTED RESOURCES STANDARD COORDINATION

Chair: Gerald Johnson

Vice Chair: TBA

Established, 1999

Output: Standard through the SCC 21

Expected Completion Date: 20xx

Assignment: To interface with SCC21/P1547 in order to reduce unnecessary delays by getting PSRC input into the process without having to wait for after-the-fact coordination.

Working group K10 met on Wednesday Sept 12, 2012 in Portland, OR with 9 members and 4 guests in attendance. I went over the progress of P1547.5, P1547.7, and .8 from the August 20...24, 2012 working group meetings in San Francisco:

P1547.5 “Draft Technical Guidelines for Interconnection of Electric Power Sources Greater than 10MVA to the Power Transmission Grid” Chair M. N. Satyanarayan, Co-Chair; Tom Basso, Secretary. (Withdrawn)

IEEE P1547.7 “Draft Guide to Conducting Distribution Impact Studies for Distributed Resource Interconnection” Robert Saint, Chair; Tom Basso, Secretary. Nearly all Draft 7.0 comments were resolved at the August 2012 meeting. Remainder will be resolved by phone conference and Draft 8.0 will be submitted for ballot in January 2013

IEEE P1547.8 Recommended Practice for Establishing Methods and Procedures that Provide Supplemental Support for Implementation Strategies for Expanded Use of IEEE Standard 1547. Writing groups provided draft inputs which will be posted as draft 4 on or about October 31, 2012.

We also discussed the results of the May SCC21 Piscataway, NJ meeting covering the future of main standard 1547-2003. Three areas defined by the majority of the attendees are as follows:

- Voltage regulation (IEEE Std 1547 clause 4.1 General requirements sub-clause 4.1.1 Voltage regulation).
- Voltage ride through (IEEE Std 1547 clause 4.2 Response to Area EPS abnormal conditions sub-clause 4.2.3 Voltage)
- Frequency ride through (IEEE Std 1547 clause 4.2 Response to Area EPS abnormal conditions sub-clause 4.2.4 Frequency).

A PAR is being submitted to amend 1547-2003 to address these three topics. Tom Basso will be the chair and Jim Daley will be the vice. The first meeting of the working group for the P1547a amendment to IEEE Std 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems and will be held Thursday, November 29 (8:00 am – 5:00 pm) & Friday, November 30 (8:00 am -12:30 pm), 2012 at the Embassy Suites in Piscataway, NJ. I plan to attend.

We then had open discussion of recent DG activity in member regions.

Old Business:

None

New Business:

Guide on Static VAR Compensator Protection

I8 in substations committee is planning to write a guide on static VAR compensator (SVC) protection. Pratap Mysore attended their meeting and informed them that anything presently covered in the PSRC guide documents cannot be covered by their document. This leaves mainly protection functions in the SVC control systems to limit abnormal operating conditions. A joint working group between PSRC and Substations was suggested. This will be brought up for discussion at the next NESCOM meeting.

IEEE Transactions on Power Delivery Paper Critical of C37.99

There was a discussion regarding a recent paper published in the IEEE Transactions on Power Delivery titled, "*Inadequacies of the Industry-Standard IEEE C37.99-2000 Concerning Grounding Neutrals of Shunt Capacitors in High-Voltage Substations*" The details of grounding was removed from C37.99 and IEEE guide 1036-Application guide for shunt capacitors is now referred to in the C37.99 document. The chair of the capacitor subcommittee was contacted to address issues mentioned in this paper.

Single Phasing Of Nuclear Generating Station Auxiliary Power Buses.

The nuclear industry is looking for guidance on detection of single phasing conditions to auxiliary power buses. Gary Kobet described the issue and requested that K subcommittee create a Task Force to look into the issue. The subcommittee voted to form KTF11 with C. Sufana to chair the meeting in January to gauge interest in forming a working group.

Change of subcommittee leadership

Pratap Mysore thanked the vice chair and the members for their support during his tenure as the chair of the K subcommittee. Michael Thompson will be taking over as the chair of the k-subcommittee from January 2013 and Don Lukach will be the new vice chair.

General Discussion:

There was no general discussion.

VII. PRESENTATIONS:

Our meeting was enhanced with the following presentations:

Smart Grid Interoperability Panel standards coordination process - Mladen Kezunovic

WG J9: Motor Bus Transfer - Tom Beckwith

VIII. At 11:55 am the meeting was adjourned by Chairperson Bob Pettigrew