



POWER SYSTEM RELAYING COMMITTEE

OF THE

IEEE POWER ENGINEERING SOCIETY

MINUTES OF THE MEETING

September 9 - 11th, 2008

Vancouver, BC,CA

Draft 2

Power System Relaying Committee

Main Committee Meeting Agenda

Sept. 11, 2008

Vancouver, BC

8:00 AM – 11:30 AM

- | | |
|----------------------------------------------------------------|-------------------------|
| I. Call to order / Introduction | Charlie Henville |
| II. Approval of Minutes/Financial Report | Bob Pettigrew |
| III. Reports of Interest | Charlie Henville |
| A. Technical Paper Coordinator's Report/Future Meetings | Miriam Sanders |
| B. PES Report- points of interest | Wanda Reeder |
| C. CIGRE Report | T. W. Cease |
| D. UCA Report | John Burger |
| E. EPRI Report | John Hughes |
| F. IAS Power System Protection Committee | Chuck Mozina |
| G. IEC Report | Eric Udren |
| H. Standard Coordinator's Report | Jeff Gilbert |
| I. Substation Committee Report | Mike Dood |
| J. NERC Report | Bob Cummings |
| K. Other Reports of Interest | |
| IV. Advisory Committee Reports | Charlie Henville |
| B1. Awards/ Recognition | Bob Beresh |
| V. Subcommittee Reports | Charlie Henville |
| C- System Protection | Rich Hunt |
| I - Relaying Practices | Tarlochan Sidhu |
| K - Substation Protection | Frank Plumptre |
| H - Relaying Communications | Alex Apostolov |
| D - Line Protection | Mike McDonald |
| J - Rotating Machinery | Wayne Hartmann |
| VI. Presentations | Bob Pettigrew |
| VII. Adjourn | Charlie Henville |

I. Call to order / Introductions

Henville

Chairman Charlie Henville called the meeting to order at 8:05 am.

II. Approval of Minutes (January Meeting) & Financial Report

Pettigrew

The minutes of the Kansas City (May, 2008) meeting were approved. The Kansas City meeting again was slightly profitable a continuing trend. The Vancouver meeting is expected to show a loss due to higher than normal meeting room charges and a minimum food and beverage charge. Results will be reported at the next meeting. There are three sponsors for the Vancouver meeting that have helped significantly with our overall budget. The Vancouver sponsors are: Henville Consulting, General Electric Co, and BC Hydro. Thanks again for this generous support of the PSRC.

III Chairman's Report

Henville

Attendance at this meeting is above average for September and while not a record number is certainly indicative of the sustained interest in the Committee activities.

Personally I am here with mixed emotions. Happiness that so many of my friends have been able to participate in this meeting, and sadness that this will be my last meeting as Chair of such a rewarding Committee. In fact, I can attest to the fact that participating in the leadership of this committee has been one of the most rewarding parts of my entire professional career.

In completing my term as Chair of this group, I want to acknowledge the efforts of as dedicated and competent a team of volunteers as you would find in any IEEE organization.

Miriam Sanders, as Vice Chair and in charge of technical programs and future meetings has turned out high quality programs for our contributions to PES meetings, and at the same time arranged high quality hotels at reasonable rates for our own PSRC meetings.

Bob Pettigrew, as Secretary/Treasurer has organized smoothly functioning meetings, great receptions and meeting facilities to facilitate our work all the time managing the financial side to make sure the group is self sustaining.

Jeff Gilbert, our Standards Coordinator has been an unfailing resource in getting our standards projects started and completed on time and before the dreaded "PAR Expiration"

The Subcommittee Chairs and Vice Chairs have continued to move forward more than 60 different working groups and task forces to meet the needs of the protective relaying segment of power systems.

And the working group officers and participants working so many long hours to complete the assignments with so much effort going into the activities.

As a note on the movement of this committee to one of inclusiveness in the Power and Engineering Society we can see several relevant activities in the last few years

- Our first participation in a joint technical committee meeting in San Antonio last year, and the second one to come in Atlanta in January.
- The creation of a jointly sponsored working group with the EMC and T&D Committee with the first meeting in January 2009.
- Leadership in creating and participating in Super-sessions to enliven and revitalize the PES General meeting.
- Consideration of proposals to develop tutorials to participate further in PES meetings to share information with the rest of the industry and to further participate in PES activities.

All of these point to increasing involvement of this committee in the activities of the PES.

There will soon be an upcoming review of the position of the PES and its way forward in which the PSRC will participate. There will be a meeting of representatives from the PES technical council in Denver at the end of this month, and Bob Pettigrew will be attending that meeting. The view of the strategic planning working group and the Advisory Committee is that there is no need for significant change within the PSRC.

However, I hope that we will be able to move forward over some jurisdictional hurdles that have hampered our work in the past.

As a sign of our growth we are getting increasingly squeezed for time to achieve all the activities we want to achieve. The officers will consider for the January meeting two additional concurrent sessions on Wednesday evening. Say from 6:00 pm to 7:00 pm. Initially, one session would be on IEC 61850, and the other would be on NERC activities since Zone 3 work. Several people showed their hands as being interested in such an evening session.

Finally I want to thank all PSRC participants for the true cooperation and willingness to work together that you have demonstrated that help us all, especially myself to, feel a great pride and sense of accomplishment in the past achievements. We also hope for continued and increased success in the future in helping the industry that we all are passionate about.

Reports of Interest

A. Technical Paper Coordinator's Report – Sept. 2008

Sanders

Charles Henville presented Miriam Sanders' report with her apologies for being unavoidably absent.

There was a new type of session in the PES General meeting - the paper forum. While there were a few bumps along the way, this format looks promising. The PSRC sponsored several transaction papers presentations and around a total 65 papers were presented.

Request for reviewers is active right now for the Power Systems Conference and Exposition in Seattle, March 2009. This is a smaller conference and the numbers of papers are few - probably about 12 now.

In response to a question from the floor, it was noted that the time between submission of a paper and the actual conference (about 6 months) was shrinking slightly, but not in major steps. For instance the closing date for the PSCE was delayed from 28th August to 15th September in order to try to obtain more submissions.

Future meetings

The January meeting location has been moved from Orlando to Atlanta. The dates are still the same, 11-15 January. The reason is that the negotiations with the hotel broke down before the contract was signed.

The September 2009 meeting will be in Arlington Texas. A contract has been signed with the Arlington Sheraton for Sept. 14-17, 2009. Please note that the meeting time slots have been increased by a half of day. This will be the first meeting that will try the new format. The meeting will start as usual with the Monday evening reception and working groups on Tuesday morning. However, Wednesday will be all day of working groups, Thursday morning will be subcommittee meetings and Thursday afternoon will be the main committee meeting. Since this is near the Dallas-Fort Worth airport, many should be able to get flights out early evening. For the West Coast, the meeting schedule will be advanced to Monday afternoon.

B PES Report

Wanda Reeder

No Report submitted.

C. CIGRE B5 Activities Report

Cease

The 2008 Session was held in Paris France August 24-29, 2008.

This was the year of change in personnel. The Chairman: Ivan de Mesmaeker was replaced by Javier Amantegui, the Secretary: Paul Hindle was replaced by Iony De Patriota and I was replaced by Mark Adamiack.

At the Session 5 new working groups were started. They are:

JWG (SC B5/B4) Impact of HVDC on Protection & Control,
 Protection of hybrid line/cable circuits in transmission networks,
 Protection requirements on transient response of voltage and current digital acquisition chain,
 Standardized protection schemes*, and
 JWG (B5/D2) Application Guide on digital inter-S/S communications for protection.*

Anyone wishing to participate in any of these working groups please see Mark Adamiak.

The 2009 Colloquium will be held in Jeju South Korea October 19-24, 2009. The CIGRE Colloquium will be held in conjunction with the Advanced Power System Automation and Protection Conference (APAP2009).

The preferential subjects for the 2009 Colloquium are:

1. Strategies for the Lifetime Maintenance of Substation Automation Systems
2. Protection & Control of FACT devices and their impact on Protection Systems
3. Wide Area Monitoring, Control & Protection Technologies

Study Committee B5 has a number of open working groups. Several of these working groups will close this year and new working groups will be formed. Anyone wishing to become involved in CIGRE work is invited to participate in these working groups as they are formed.

D.	UCA Report No Report	Burger
E.	EPRI Report No Report.	Hughes
F.	IAS Power System Protection Committee	Mozina

The following are items of interest to the PSRC:

- **Color Book Reorganization Progress** – The IAS 2008 General Meeting will be held on Oct. 5-9 in Edmonton, AB. where one of the major undertakings will be the updating and reorganization of the color book series. The color books are to be combined to reduce their number and a common or “Base Book” standard developed which is to have common material that is now in a number of individual color books. Major interest for the PSRC is the Buff Book (Protection and Coordination of Industrial and Commercial Power Systems), which will be combined with the Blue Book (Low Voltage Protection Systems) into a single set of stand allow IEEE standards. The goal is to break out the chapters, which address protection of individual areas (transformers, generator, cables, est.) so the IEEE could sell them separately. Each individual charter will each be assigned a PAR and will be a “stand allow” standards document. Two Buff book chapters (Instrument Transformer and Generator Protection) as well as one old blue book chapter were select as trial updates to see how the system that has been created with the IEEE Standard Board will work.
- **Generator Grounding and Ground Fault Protection WG** – This WG is investigation potential transient overvoltages associated with hybrid generator grounding. The WG has completed extensive EMPT studies to define the switching surges created by switching the low resistance ground source at the neutral of the generator. Surge protection has also been defined by the WG. The WG paper was presented at the May 2008 IAS I&CPS conference and has been submitted for republication in IAS transactions. WG members will present a half-day tutorial at this year PCIC (Petroleum and Chemical Industry Conference) to

be held in Cincinnati on Sept 21-25. The WG will continue its efforts with an investigation of system grounding at industrial facilities with multiple ground sources.

G. IEC Report

Udren

TC 95. Measuring relays

The USNC Technical Advisory Group (WG I4) continues to evaluate and vote on IEC 60255 Series measuring relay standards. In the case of equipment design and EMC standards, we have no US members of working groups that develop the standards, and thus limited influence. In the case of new IEC functional standards projects, we have the active participation of Dr. Murty Yalla, who can travel to international maintenance team (MT) meetings. Design standards now in development are:

95/231/CDV – IEC 60255-1, Measuring relays and protection equipment - Part 1: Common Standards

This is an overall standard, like IEEE C37.90, and is to absorb and replace multiple existing IEC relay standards. In this new voting draft, the IEC WG deleted the Annex B table listing the correspondence of protection functions, IEEE C37.2 function numbers, and IEC 61850 logical node names. There was no request for this deletion by any national committee voting on the prior draft. The USNC voted against this latest draft and requested that the table be reinserted. We supplied the latest version of the table from the new IEEE C37.2-2008 (published October 3).

95/225/CDV - IEC 60255-11 Ed.2: Measuring relays and protection equipment - Part 11: Voltage dips, short interruptions, variations and ripple on auxiliary power supply port -

The test suite now includes checks for a full range of auxiliary power supply quality problems, including short interruptions to zero or partial voltage, and longer interruptions. Ripple of 15% is specified at power frequency or twice power frequency. The test includes gradual ramp up and down of supply, and reversal of supply polarity. Depending on the problem, the relay must ride through the disturbance with no functional impact, or temporarily cease operation and resume when the supply is restored. The US has voted in favor and this will become a new standard, despite unwillingness of the WG to include a requirement for statement of relay reboot time that the US requested.

95/231/CDV - Measuring relays and protection equipment - Part 1: Common requirements – Major differences from C37.90, and problems found. Vote in September – more review by July 21.

95/230/FDIS – IEC 60255-26, EMC Requirements

For RF immunity and ESD tests, IEC has less demanding compliance levels than IEEE C37.90.2 and .3. For RF, IEC requires 10 V/m modulated, while IEEE calls for 18 V/m modulated & 35 V/m unmodulated field strength. The IEC test is thus not a challenge for manufacturers testing to IEEE levels. The US has consistently viewed the IEC level as inadequate and has voted negatively. We cast a vote against this final standard with explanation; the standard passed and the vote tally is published.

95/241/RVC and 95/242/FDIS – IEC 60255-22-5, [Lightning] Surge Test

This is a high-energy surge with slow rise and fall and large energy content. This is not like any IEEE relay surge test, and not representative of conditions in a substation control building. It would be a good test for a device connected on a distribution feeder near where lightning might strike. IEC requires this sort of surge test in general for electronic devices. The US is planning a favorable vote at this time.

95/240/DA – Draft agenda for TC 95 meeting in Sao Paulo, Brazil in November – Murty Yalla will attend for the USNC.

Functional standards now in development are:

Draft 60255-151 - Functional standard for over/under current protection. The new draft Standard by MT 3 under Murty Yalla absorbs, updates, and supersedes IEC 60255-3 and IEEE C37.112-1996. The document is excellent and should be complete in 2008.

Draft 60255-127 - Functional standard for over/under voltage protection. This work by MT4 is similar in structure to -151, but only one inverse time curve shape is shown. The question is whether this is suitable for known applications of inverse-time overvoltage or undervoltage functions.

TC 57, Power systems management and associated information exchange

WG 10 is developing documents for IEC 61850, Edition 2:

Part 7-1: Basic communication structure for substation and feeder equipment - Principles and models - Revision project initiated and CDV circulated with vote due in October.

Part 7-4: Basic communication structure - Compatible logical node classes and data classes – CDV with vote was due in August.

Part 7-2: Basic information and communication structure - Abstract communication service interface (ACSI) – Comments on CD circulated; new CDV circulated with vote due in October.

H. Standard Coordinators Report

Gilbert

The Standards Coordinator, Jeffrey Gilbert, was not able to attend the September PSRC meeting due to health reasons,

Information concerning the Standards Association (SA), Board of Governors, Committees of SA, and development of standards, recommended practices and guides and related issues is available on the following web site.

<http://standards.ieee.org/>

Important Information

Remember to review the IEEE Patent Slides for use at all Standards Development meetings. The slides are available at:

PPT version:

<http://standards.ieee.org/board/pat/pat-slideset.ppt>

PDF version:

<http://standards.ieee.org/board/pat/pat-slideset.pdf>

Standards Coordination Effort

PARs applied for by all Committees of the Power Engineering Society (PES) are listed in the NESCOM meeting minutes. The June 2008 meeting minutes included the following PARs requested by the IEEE Industry Applications Society/Technical Books Coordinating Committee (IAS/TBCC)

P3004.1 Recommended Practice for the Application of Instrument Transformers in Industrial and Commercial Power Systems

P3004.10 Recommended Practice for Generator Protection in Industrial and Commercial Power Systems

These PARs were approved until December 31, 2012 with a note to the Working Group to maintain close coordination with the IEEE Power & Energy Society/Power System Relaying Committee.

Standards Activities Since The May, 2008 Meeting

The status of the standards activities, which have taken place since the May, 2008, meeting of the PSRC, are as follows.

1. Standards Published

C37.91 IEEE Guide for Protective Relay Applications to Power Transformers

C37.110 IEEE Guide for the Application of Current Transformers Used for Protective Relaying Purposes

2. Standards waiting to be Published

None

3. Standards Reaffirmed

None

4. Standards submitted for reaffirmation

C37.106 Guide for Abnormal Frequency Protection for Power Generating Plants

5. Standards approved

None

6. Standards submitted for approval

None

7. Standards to be submitted for approval

None

8. Submitted for Balloting/ Recirculation

None

9. Standards Balloted

None

10. Standards Re-circulated

None

11. Standards to be Re-circulated

PC37.105 IEEE Standard for Qualifying Class 1E Protective Relays and Auxiliaries for Nuclear Power Generating Stations

12. Standards due for 5 year review /to be submitted for Re-affirmation

C37.115 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

13. Standards withdrawn

None

14. New PARs applied for

PC37.238 IEEE 1588 Profile for Protection Applications

15. New PARs approved

None

16. PAR Extensions applied for

None

17. PAR Extensions approved

None

18. Modified PAR approved

None

19. Modified PAR Submitted

None

20. PARs Withdrawn

None

21. PARs expiring at the end of 2008

None

SUBMITTAL DEADLINES & STANDARDS BOARD MEETING SCHEDULE

PAR/Standard Submittal Deadline Standards Board Meeting

August 15, 2008

September 24, 2008

I. Substation Committee Report

Dood

Working Group C1, Application of Computer Aided Systems to Substations met on Monday morning with 4 members and 16 guests. The Chair, Mr. Sciacca gave an overview of 1686 – Standard for Substation IED Cyber Security. Now that 1686 has been published began discussing where we want to go from here in the area of security. There were three things identified by comments during the work of 1686 that were considered out of scope at that time that we may now want to consider:

- Strong multifactor authentication
- Remote access
- Electronic Perimeter Definition

We discussed other items that need to be addressed including the ideas of trusted devices, trusted networks, role based methodologies, forensics, and standardizing audit logs. We also talked about some of the other work in the area of security that is happening in other IEEE Societies and in the ISA.

C1 also met jointly with H14 on Tuesday in a double session. An overview of C1 was given by Sam Sciacca and Scott Mix gave an overview of the current work on the CIP standards in the first session. The second session was devoted to discussing what type of product should come out of this joint effort. It was decided that the product should be a standard to give guidance to those who are attempting to meet the NERC guidelines.

Working Group C2 (P1613), Standard Environmental and Testing Requirements for Communications Networking Devices in Electric Power Substations – Met Monday morning with John Tengdin chairing the meeting in the absence of Lee Smith who was unable to attend. This working group is in the process of revising 1613.

Highlights of discussion:

- The introduction page that excluded relays is being taken out
- Incorporating the corrigendum and amendment into standard
- Clarifying that the standard is not just for Ethernet networks
- Must clarify the use of fans in the standard
- Clarify that the 30 cm distance for fans does not include the chamber

Working Group C6 (P1711), Trial Use Standard for a Cryptographic Protocol for Cyber Security of Serial SCADA Links Met on Monday afternoon with John Tengdin chaired in the absence of Dave Whitehead. There were 19 in attendance with 3 members.

Highlights:

- Get rid of existing links in scope and in purpose to make it less exclusive
- Check if you can diagrams in purpose with NESCOM
- Eliminate unclear language to make it more of a procurement specification
- Define if it is a procurement specification or a standard for vendors to build to
- Will send out a latest draft and Sam Sciacca's comments made to chair to all in attendance

Working Group C5 (C37.2) met in a joint meeting (PSRC I14 and Substation C5) on the revision of C37.2 was held on Tuesday afternoon. IEEE Standard Electrical Power System Device Function Numbers and Contact Designations. Work on this standard is complete and it should be published by the end of this month. John gave an overview of the work and Kevithe use of C37.2 that he had given internally in his company.

Substations Subcommittee C0 wants to once again thank the PSRC for their hospitality in allowing us to meet together. We also want to thank you for all the valuable contributions that we received in this joint meeting. We look forward to future joint meetings.

J. NERC Report

Cummings

No Report

IV. B. ADVISORY COMMITTEE REPORTS

Henville

Chair: Charlie Henville
Vice Chair: Miriam Sanders

B1: Awards and Technical Paper Recognition

Chair: Bob Beresh
Vice Chair: Solveig Ward

B2: Fellows Awards

Chair: J.S. Thorp

No Report

B3: Membership Committee

Chair: M.J. Swanson

Attendance during the PSRC meeting was approximately 182. This is considered a bit low, but still satisfactory for a meeting beyond the USA border.

13 new attendees were in our Newcomers Orientation meeting on Tuesday, which is considered excellent participation. In Miriam's absence, I made the presentation.

No management support letters were written.

26 new Service Awards were created, and will be presented during 2008.

B4: O & P Manual and WG Training

Chair: R. Hedding

No working group chair training session was held.

B5: Bibliography and Publicity

Chair: T.S. Sidhu
Vice Chair: M. Nagpal

The WG met on Sept 9, 2008 with six members in attendance. The Chair indicated that the first draft of the 2007 bibliography paper is ready and the entire paper should be ready by end of Nov. 2008. Dr. M.S. Sachdev agreed to help with the inclusion of the 2007 CIGRE papers into the draft. Mal Swanson will work with the PSRC Chairman to assist in preparation of the publicity report. There have been no NERC reports to review. Progress regarding possible creation of a searchable bibliography database will be reported at the Jan 2009 meeting as this item is being discussed at the Adcom meeting

B8: Long Range Planning

Chair: Phil Winston

B9: PSRC Web Site

Chair: Russ Patterson

Working Group B9 did not meet.

V. SUBCOMMITTEE REPORTS

C: SYSTEM PROTECTION SUBCOMMITTEE

Chair: R. Hunt

Vice-Chair: S. Ward

The C System Protection Subcommittee met on Wednesday, September 10, 2008, in Vancouver, BC, Canada, with 14 members and 25 guests in attendance.

8 Working Groups and 1 Task Force met at this meeting. The members of the Subcommittee approved the minutes of the May 2008 meeting.

The Subcommittee approved the formation of Working Group C17, Fault Current Contribution from Wind Plants. The WG Chair will be Dean Miller, Vice Chair Gene Henneberg. The WG will produce a report to the Main Committee.

While the Subcommittee members that attended the meeting all voted in favor of forming the new WG, the number present was not sufficient to reach quorum. Consequently, a ballot via email was performed and the vote to approve the WG was almost unanimous (31 members out of 34).

Thank you to all members that promptly responded by email. However, the exercise illustrates why it is important that all Subcommittee members try to attend the Subcommittee meeting.

New members: The Subcommittee welcomes new members Jonathan Sykes and Rich Young. Jonathan Sykes also volunteered to serve as the new Chair of WG C15, which was temporarily chaired by Yi Hu, now Vice-Chair of the WG.

PSCE liaison report: nothing to report.

PSSC liaison report: Nothing to report.

Reports from the WG Chairs

C4: Global Industry Experience with System Integrity Protection Schemes (SIPS)

Chair: Vahid Madani

Vice Chair: Miroslav Begovic

Output: Survey

Established: September 2004

Expected Completion Date for the Survey: September 2008

Summary Meeting Notes:

WG C-4 met on September 9 in one session with total 17 in attendance (9 M, 8 G).

Tabulated results of more than 900 schemes (from 60-70 respondents) was presented and reviewed by the WG members. Vahid indicated that the task of tabulating requires consistent interpretation and is done by Frankie Au-Yeung, Victor Ortiz, and Vahid Madani. Some of the statistical data in plot format were presented about types and reliability of the reported SIPS systems.

Some of the recent responses have arrived from across the globe, but there are notable absences of information from countries such as China, Russia, Australia, etc. We have received response from a major part of India. Several requests have been sent to Russia and China.

Members highlighted that none of the plots that were discussed / presented focused on the name of the respective company. Also, for WECC as an example, a single entry has been made.

A draft outline prepared by Stan Horowitz was discussed WG volunteers assigned to various sections of the outline. Damir Novosel and Vahid Madani will lead the preparation of the draft report with help from the volunteers for the sections.

Next Meeting – 30 People, 1 Session, Projector, Power strip

Assignment - Conduct a survey of power systems professionals worldwide to accumulate experience with SIPS. This survey will complement and expand upon the previously published IEEE/CIGRE paper "Industry Experience with Special Protection Schemes" by P.M. Anderson and B.K. LeReverend (IEEE Transaction on Power Systems, Vol. II, No. 3, August 1996). The survey will be conducted via an internet-based questionnaire with the assistance of, and be available to, other interested parties; (e.g. IEEE, CIGRE, PES, EPRI, etc.). The survey should be concluded by September 2008 and will be presented in a report to the "C" Subcommittee and a Summary Transactions paper.

C9: Appl. of Prot. Relays used for Abnormal Freq. Load Shed. & Restoration

Chair: A. Apostolov

Vice-Chair: K. Behrendt

The working group met on Tuesday, September 9th, with 5 members and 6 guests present. Chairman Alex Apostolov reported that he is working on a summary paper draft and should have a copy available for circulation to the working group soon after the Vancouver meeting. Working group comments will be solicited and discussed at the next meeting

The working group expects to meet in single session at the next PSRC meeting, and needs a room for 25 with a projector screen and outlet strip.

C11: Guide for Protection System Testing

Chair: Vahid Madani

Vice Chair: Hyder DoCarmo

Output: Guide

Established: May 2005

Expected Completion Date – Balloting Body: August 2008

PAR Approved through: December 2009

WG C-11 met on September 9 in a single session with total 24 in attendance (10 M, 14 G). After review of the patent slides, the WG members reviewed comments received from the "C" Subcommittee members and discussed edited section (by Hyder and Vahid) based on the reviewer's suggestions.

The WG thanks the C Subcommittee for the overwhelming number of approval votes and the many suggestions which have all been incorporated and discussed at the September meeting. Members of the C subcommittee are part of the balloting body and will have an opportunity to further comment on the draft Guide during the balloting open period.

The WG members believe the Draft Guide is ready to start the process for forming the balloting body and official process for review by the IEEE. We need support from the C subcommittee to participate in the official process.

Next Meeting – 30 People, 1 Session, Projector, Power strip

Scope, Purpose, and Reason:

This guide is intended for power system protection professionals. It will include a reference listing of type tests for protective devices as well as overall protection scheme performance tests for various types of protection schemes. The Guide will describe the methods, extent, and types of protection scheme tests. Interlocking and control functions inherent to the protective schemes are included. This assignment encompasses overall system testing procedures, data collection requirements, as well as the test procedure definitions.

Reason:

This document will aid academic, manufacturing, application engineers and industry protection professionals with the overall benefits for protection scheme performance testing. The document will

discuss benefits and challenges associated with verification of overall protection performance and will include information such as: a) Listing of type / production tests, b) Product performance tests from user view, c) Commissioning test - d) Relay settings are properly selected and calibrated e) Verify connections and calibration of settings, f) Trip/no trip and troubleshooting test.

C12: Performance of Relaying During Wide-Area Stressed System Conditions

Chair: Damir Novosel

Vice Chair: George Bartok

Output: Working Group Report and IEEE Summary Paper

Established: 2004

Expected Completion Date: 2008

The working group met in a single session chaired by George Bartok, the Vice Chair, on September 9, 2008 with 7 members and 5 guests present.

Prior to the meeting, the Working Group final report had been approved by the System Protection Subcommittee and by the officers of the PSRC for publication on the PSRC website. Comments received from Charlie Henville and agreed upon by the Working Group members at the last meeting were incorporated into the report. Because of the nature of the corrections made to the report, re-balloting by the Subcommittee was not necessary.

The first draft of an IEEE Summary Paper was prepared by Damir Novosel prior to the meeting. Sections of this draft were subsequently reviewed by a subset of the Working Group and a revised draft (Draft 3) was distributed at the meeting. It was decided that additional review was needed. Demetrios Tziouvaras and Gene Henneberg will conduct this review, concentrating on Section 2. They will also suggest figures that might be incorporated into the summary paper. This will be completed by October 31st.

The Working Group decided that the Summary Paper should be published as an IEEE Transactions paper. It will be formatted to meet the IEEE requirements.

The paper will be submitted for presentation at the Georgia Tech Relay Conference, Texas A&M Relay Conference and Western Protective Relay Conference. Solveig Ward has already prepared an abstract for the Texas A&M Conference.

Pratap Mysore has submitted an abstract to present the Working Group's results at the MIPSYCON conference in Minnesota on November 4th.

The Working Group has completed its assignment and is not planning to meet at the next PSRC meeting.

C13: Undervoltage Load Shedding

Chair: M. Begovic

Vice-Chair: S. Imai

Output: IEEE Report

Established: September 2005

Expected Completion Date: January 2009

The UVLS Working Group met on September 10 with 8 in attendance. After introductions, assignments decided in the last meeting were reviewed and the timeline toward the next meeting were determined as follows;

- September 30 - Clean up the document reflecting remaining contributor's assignments and send to editor group determined in the last meeting (Imai)
- November 20 – The report reflecting editor's comments will be updated to the working group web-site and email will be sent to ask working group members to review

Remaining assignments on the latest draft (4.1) discussed in Kansas City Meeting

- References need to be added to Section 3.1.3 (Charlie Henville)

- References need to be added to Section 5.1.1 (Richard Young)
- Text on centralized schemes for Section 5.2.1 will be solicited (from Steve Conrad, or Jean-Marie Gagnon)
- Text on distributed schemes for Section 5.2.1 will be added (by John Burger)
- Text on Centralized / Wide Area UVLS for Section 5.2.2 will be added (by Shinichi Imai, possibly also by Ken Martin)
- Text on Voltage Slide Scheme for Section 6.1.1 will be added (by Harley, to be sent by Cunico)
- References for Section 7.6.1 will be added (by Vahid Madani)
- Text on Coordination UVLS – UFLS will be added (by John Burger)
- Text on Maintenance / Testing / Reliability will be expanded using CIGRE “Defense Plan” report as a template (by Vahid Madani, Miroslav Begovic)
- References to the names of companies and specific products will be removed from the report (Shinichi Imai, Miroslav Begovic)
- Sections 9 and 10 will be moved into the Appendix of the report
- Text on 1987 voltage collapse in France is needed (Miroslav will try to contact Daniel Karlsson)
- Editors have been assigned to read the text of the entire report (Miroslav Begovic, Shinichi Imai, Damir Novosel, Vahid Madani, Ken Birt, Alex Apostolov, George Nail)

We request a projector and a room for 15 people at the next meeting. At this time, we request a time allotment for a single session.

Assignment: This working group produces a report on the implementation of undervoltage load shedding (UVLS) in electric power systems. It presents background information, guidance in implementing UVLS schemes and a bibliography. Voltage instability, voltage and reactive power management, emergency actions to avoid load shedding, UVLS philosophy and methods, voltage collapse detection, existing practices, settings and coordination between UVLS and UFLS are discussed.

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: December 2009

Assignment:

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

Scope:

Develop a report that identifies synchrophasor data and parameters that are useful for improving protection schemes and analyzing protective relay performance. The report will not include deployment of devices to acquire time synchronized measurements.

Working group C14 met on September 09, 2008, in Vancouver, BC, in a single session chaired by Jim O'Brien with 12 members and 33 guests. 3 guests joined the working group as members.

The chair distributed an up-to-date draft of the proposed Outline, which was discussed by the group.

Additional topics were brought up such as addressing local and wide area protection, protection and protection-related applications, and the C37.118 synchrophasor standard as applied to this report.

Line current differential protection was proposed to be moved to the Future Applications section along with other differential protection types such as bus, transformer, etc.

It was proposed to reference the standard C37.118 to limit the scope of the report; however, the existing applications do not use C37.118.

The scope defines only protection applications. The protection-related functions such as power swing detection should also be defined in the scope.

Other potential applications were proposed such as distribution bus differential protection and reclose control.

Gustavo Brunello mentioned the CERTS report Phasor Technology Research Roadmap for the Grid of the Future, which outlines actions on the present and future phasor measurement applications.

Since the topic appears to be quite broad, it was suggested to solicit all applications of synchrophasors, which can be useful or possible to use to determine which are to be addressed in the report.

The WG assignment before the next meeting is as follows:

- Working group members are requested to submit to the chair, Jim O'Brien, via email (jmobrien@duke-energy.com) anything, which is done with synchrophasors in the protection and protection-related areas and the ideas what to do with them by November 1st, 2008.
- Jim will generate the list, and the working group will sort out protection from non-protection synchrophasors on the January 2009 meeting.

Requirements for the next meeting are as follows: single session, meeting room for 50 people with a computer projector.

C15: Design and Testing of selected SIPS

Chair: J. Sykes

Vice-Chair: Y. Hu

Output: Report

Established: September 2008

Expected Completion Date: December 2012

Working group C-15 held its first meeting on Wednesday, September 10, 2008 in single session with a total of 28 people in attendance. The working group opened this meeting with a review of its background and the meeting minutes of the May 2008 task force meeting. The working group focused on its discussion on defining the assignment of the group after Rich Hunt from C-Sub-committee appointed Jonathan Sykes and Yi Hu as the Chair and Vice Chair of the working group.

Based on the recommendations of the last task force meeting, the working group discussed and agreed that the assignment of the working group will be to produce a report in three years on industrial practices in design and testing of selected SIPS. Several candidate SIPS that have shown wide applications in the C-4 survey results were discussed. The working group also agreed to change its title to "Design and testing of selected SIPS" to more accurately reflect its target assignment.

The discussion of what the report should include leads to the following recommendations:

- The report should include a high level general design considerations for SIPS
- The report should have proper reference to C-4 and C-11 results
- The report will not include planning component
- For each of selected SIPS, the report should include the following areas
 - Basic design, design considerations
 - Flexibility and expandability
 - Redundancy, dependability and security
 - Detection methods, required communication support, etc.
 - Maintainability (design for testing), system coordination, regular testing plans

The working group will meet at next PSRC meeting in two-sessions to finalize the assignment of the working group. The group Chairman and Vice Chairman will prepare and circulate a sample assignment statement to members of the working group prior to next meeting.

Next Meeting – 30 People, 2 Consecutive Sessions, Projector, Power strip

C16: Relay Scheme Design for Modern Relays

Chair: K. Birt
Vice-Chair: R. Lascu
Output: IEEE report
Established: May 2008
Expected Completion Date: 2010

C16, Relay Scheme Design for Modern Relays, met for the first time on Tuesday, September 9, 2008. There were 32 people in attendance.

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

- Exclude: AC voltage and current inputs
 - Goose
 - Internals of relays
 - IRIG and communication issues
- Include: signaling between protective elements such as relays, breakers, etc. primarily as it applies to trip and control circuits

A presentation of the summary paper of the 1999 relay trip design paper was given by Mohamed Ibrahim, IEEE fellow and consultant of Siemens company, which was well received by the working group members and guests. A lively discussion then occurred on topics that should be included in the outline and also on finalizing the scope of the paper (i.e. addendum to original paper versus stand alone report). The preliminary outline will be revised by K. Donahue and J. Sperl by December 1st. Raluca Lascu will circulate the outline before the January meeting.

Requirements for the next meeting: single session, a room for 40 and computer projector.

CTF17: Testing and Design of SIPS

Chair: D. Miller
Vice-Chair: G. Henneberg
Output: Report by the Joint Working Group
Established: September 2008
Expected Completion Date: 2010

Task Force 17 met in a single session on Tuesday, September 9, 2008 in Vancouver, BC; with 25 attendees. Of those attending the meeting 18 elected to become members of the future working group.

After introductions, Charles Henville described what had occurred at the first organizational meeting for the Joint Working Group. This meeting took place on July 23, 2008 at the PES General Meeting. The Joint Working Group will consist of members afflicted with the PSRC, T & D, and the Electric Machinery Committee (EMC).

After a discussion on the possible assignment for a working group and how the PSRC members would be organized to support the activities of the Joint Working Group it was decided to ask the subcommittee for the permission to form a working group of the System Protection Subcommittee for this purpose.

The assignment of the Joint Working Group is: "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." The assignment for the System Protection Subcommittee Working Group will be: To support the activities of the Joint Working Group on Fault Current Contributions from Wind Plants in the production of a report that characterizes and quantifies the short circuit current contributions to faults from wind plants for the purposes of determining protective relay settings and fault interrupting equipment ratings. The report will provide guidelines on the modeling and calculations for that purpose.

The scheduled meetings for the Joint Working Group are planned to be at the following times:

- PES Joint Technical Committee Meeting in January
- PES General Meeting in July

- PSRC meeting in September (or May)

The Working Group will meet with the Joint Working Group in January in a single session. We will need a room for 35 people with a computer projector. A presentation on fault current contribution will be given by an engineer from a wind turbine generator manufacturer.

D: LINE PROTECTION SUBCOMMITTEE

Chair: M.J. McDonald

Vice Chair: Russ Patterson

The Subcommittee meeting was called to order at 3:00 pm on May 14, 2008 with 26 members and 19 guests.

A quorum of SC members was verified with the January 2008 meeting minutes approved after the WG reports.

- After introductions the chair had IEEE Senior and Fellow members stand up and encouraged the remaining attendees to apply for senior membership.
- The chair directed all working group chairmen to put in their minutes when their document had been approved by the subcommittee. This would be a trigger to the PSRC officers to review the document.
- WG D1 and D5 made their final reports and were disbanded.
- After the DTF2 report the SC voted to update the Task Force to a WG which will convene at the September meeting as WG D2.

Reports from the WG Chairs:

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

Chair: Gary Kobet

Vice Chair:

Output: IEEE Guide

Established: September 2008

Expected completion date: Undetermined

Working Group D2 held its initial meeting on Tuesday morning with 17 attendees. Eleven of the attendees volunteered to become members of the working group. The IEEE patent requirement slides were presented, and attendees were given the opportunity to identify any known patent claims.

The working group assignment was discussed. Mike McDonald suggested the wording be slightly modified to include the original approval or reaffirmation date of the guide (using the WG D9 assignment as an example).

The vice chairman noted that a PAR for this working group will be submitted in early January 2009. In preparation of this request, the working group reviewed the scope of the existing guide and deemed it adequate for the PAR after deletion the word "current" in the first sentence.

The working group reviewed the table of contents/outline of the existing guide. Working Group members volunteered to review existing clauses and provide feedback to the chairman by November 30th. Working group members also provided additional topics that they felt should be covered in the guide. These were added to the outline.

Joe Perez was not able to find a corresponding document on the IEC website. He will talk with Eric Udren to verify an IEC reclosing document does not exist.

Pratap Mysore indicated that regional entities have begun to gather information on member utility automatic reclosing practices. Working group members were requested to provide this information as available to the chairman for possible inclusion in the guide.

Next meeting requirements: Single meeting, 20 persons, computer projector.

D4: Application of Overreaching Distance Relays

Chair: Russell W. Patterson
Vice Chair: Walter P. McCannon
Output: Working group report to PSRC.
Established: May 2004
Expected completion date: January 09

Working Group D4 met with 8 members and 12 guests. Total in attendance was 20.

The chair opened the meeting by reading the scope of the working group assignment and then introductions. There were no minutes to approve since the working group did not meet during the May 2008 PSRC meeting.

The working group discussed Walter McCannon's incorporation of Charlie Henville's comments on the April draft of the document. Walter explained how he revised the document accordingly to address the various concerns.

The chairman asked that WG members review the document by October 10th and provide comments and/or their approval of this latest draft. Once the WG has approved the document then it will be sent to the D subcommittee for review.

The goal is to complete the report by the January 2009 PSRC meeting.

Next meeting Requirements: Single meeting, 20 persons, computer projector.

D9: Revision of C37.113 - Guide for Protective Relay Applications to Transmission Lines

Chair: Mohindar Sachdev
Vice Chair: Simon Chano
Output: Revised IEEE Guide C37.113
Expected completion date: 2009
Draft 2

The WG met at 4:30 PM on September 09, 2008 in Burnaby, BC, Canada; Twenty-two members and twelve guests were present.

The Chair reported that Draft 3 could not be completed because it was taking too much time for migrating the guide from old template to new template because of problems with compatibility of macros of the two templates.

The comments received at the time of reaffirmation ballot of the previous version of the guide were reviewed to determine the actions needed to alleviate the concerns expressed by the balloters at that time. The D subcommittee has four WG reports that have been recently completed. Four members of the WG volunteered to review the reports and provide drafts based on those reports for including in the guide.

Draft 3 of the guide will be distributed as soon as it can be completed after all the outstanding contributions are received.

Next meeting: WG will meet in one session for 45 persons with a computer projector.

D11: Effect of Distribution Automation on Protective Relaying

Chair: Fred Friend
Vice Chair: Jerry Johnson
Output: Report to the PSRC
Established: January 2005
Expected Completion Date: January 2010

The working group, chaired by Fred Friend, met on Tuesday afternoon with 9 members and 13 guests present. The WG membership is now 20 with the addition of one new member, David Zinn.

Minutes from the Kansas City meeting were read and approved. The WG spend most of the meeting reviewing clause 5.0 of the document which includes various (many) DA methods, and concluded that we can not cover nor should we attempt to cover all methods and options. Our objective is to determine the effect of DA on protective relaying not to identify every DA method that could be used. We concluded it

would be best to keep the referenced DA methods as generic as possible but still informative relative to the impact on relaying. The WG decided to establish a team to generate a group of generic DA one-line figures and build on those. The figures will be completed and sent out in time for discussion at the January meeting so we can wrap up clause 5 and move on to the impact on relaying addressed in clause 6.

The WG continues working on Draft 2.0 of the report.

Next meeting: single session, 30 attendees, computer projector.

D21: Investigate Supporting IEC Std for Distance Relay Characteristics

Chair: Alex Apostolov

Vice Chair: Alla Deronja

Output: IEEE/IEC Standard

Established: September 2006

Expected Completion Date: December 2008

Scope: Provide an IEEE/PSRC technical input to the ongoing development of IEC Standard 60255-121, dealing with distance relays to standardize impedance relay characteristics, performance, accuracy, and testing aspects.

Working Group D21 did not meet on September 10, 2008, in Vancouver, BC, because the initial draft of the IEC standard 60255-121 is not yet available.

The draft of the Standard will be circulated to the group by Murty Yalla as soon as it becomes available.

Requirements for the next meeting are as follows: single session, meeting room for 20-25 people with a computer projector.

D22: Performance Testing of Transmission Line Relays for Frequency Response

Chair: Tom Weidman

Vice Chair: Solveig Ward

The D22 meeting met Wednesday, September 10, 2008 at 8:00 am with 8 members and 8 guests present. WG stands at 28 members. This was the WG's fourth meeting.

WG Assignment

Investigate the feasibility of defining a range of frequency and rate of change of frequency to be using in a performance specification for protective relaying functions. If this proves feasible then the WG will pursue the feasibility of developing a test process for transmission line relays subjected to off frequency disturbance including rate of change of frequency conditions during stressed system conditions.

Working Group discussed the PSERC report, "Transient Testing of Protective Relays: Study of Benefits and Methodology" that is now available on the PSERC website as a public document. The discussion centered on the Distance Relaying and UFLS relaying testing reported in the PSERC paper as it relates to methodology of testing and results during off-frequency system operation.

Draft 2 of the WG report was discussed. Draft 2 is now in report form including outline format. Section 9 contains the proposed draft test for line relays when subjected to off-frequency system conditions. The WG assignment is to comment on Section 9 and be prepared at the January meeting to arrive at a draft test. This draft test will be conveyed to NERC SPCTF for their comments.

Chairman thanks Solveig Ward for her help as the vice chair. Solveig has resigned as vice chair due to her new position as vice chair of C SC..

WG requests a meeting room for 25 with a computer projector and a power cord for the January PSRC meeting.

D24: Transmission Line Applications of Directional Ground Overcurrent Relays

Chair: Don Lukach

Vice Chair: Rick Taylor

Outputs: Report to WG D9, PC37.113, Guide for Protective Relay Applications to Transmission Lines and Report to the PSRC

Established: May 2007

Expected Completion Date: May 2010

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 met with 7 members and 12 guests present. Three of the guests became members.

The May 2008 meeting minutes were approved with no changes

The initial assignment of the working group (provide input to WG D9, PC37.113, Guide for Protective Relay Applications to Transmission Lines, commonly referred to as the line protection guide) was developed, reviewed, and submitted between the May and September meetings. The final submission was briefly discussed.

The current assignment of the working group is to develop a report to the PSRC that expands on the topic of directional ground overcurrent relays applied for protection of transmission lines. The assignment is in development and not intended to be a compilation of all the existing documentation of ground overcurrent relaying practices. The assignment will be further refined during the initial writing assignment discussions planned for the next meeting.

Several industry papers and existing presentations were discussed in the context of how they can be used as references to the report, based on Draft A of the outline. Several members agreed to provide initial writing assignments, gather additional information, and help with the D24 web-site development by November 15, 2008.

Requirements for the next meeting: Single session, meeting room for 25 people with a computer projector.

Liaison Reports

The items of interest to the Line Protection Subcommittee:

Working Group on Switching & Overcurrent Protection

- The working group met on July 22, 2008 during the PES General Meeting in Pittsburgh.
- An attempt will be made to re-schedule the Network Tutorial for the 2009 IEEE PES GM in Calgary.
- The draft outline of the Distribution Overcurrent Protection Guide was discussed. Arc Flash Requirements were proposed for addition to the Guide. Fred Friend volunteered to be the liaison with the PSRC.
- Charlie Williams provided a presentation on "Hot Fuses, How Improper Fuse Installation Causes Feeder Outages and Failure of Fuse Save Schemes".
- A video on Arc Flash Hazards developed by Con Edison was reviewed.

Working Group on Distribution Automation

- Panel sessions "Distribution Automation", "Communication and Information Management Technologies for Distribution Automation", and "Utility Experiences with DSM and AMI Implementation" were conducted at the Tampa meeting in June 2007. Copies of power point slides for some of the presentations are available on the IEEE/PES website. A

Tutorial on Distribution Automation Concepts was conducted with plans to conduct the DA seminar at future IEEE PES meetings.

- Proposed topics for panel sessions at IEEE / PES 2009 General meeting in Calgary are "Integrating AMI and Advanced Sensor Data with Distribution Automation"; "DA as Part of the Smart Grid Roadmap" and "Information Models for Distribution Automation".
- Plan to publish a hardcopy book through the IEEE press on Distribution Automation.
- Create an information resource having a form similar to "Wikipedia" on the subject of DA and smart grids. The system will be a living, open access (public domain) document with no specific copyright involved with peer review of all submitted materials by a screening board.
- "Distribution Automation Initiatives at National Grid", "Distribution Automation Initiatives at ComEd", and Distribution Automation Initiative at Korea Electric Power Corporation (KEPCO)" presentations were given. Ninety percent of KEPCO feeders are automated with over 37,000 of installed automated switches resulting in a SAIDI of 17.2 minutes.

Coordination Reports

None

Old Business

None.

New Business

None.

High Impedance Fault Activity

None reported

The meeting was adjourned at 3:45 p.m.

H: RELAYING COMMUNICATIONS SUBCOMMITTEE

Chair: A. Apostolov

Vice Chair: V. Skendzic

The Subcommittee met on 09/10/08 with 63 members and guests. Minutes from the January meeting were approved.

Reports from the WG Chairs

H1: Guide for Power System Protective Relay Application of Digital Communication Channels

Chair: M. Benou

Vice Chair: Ilia Voloh

Output: Guide

Established: May 2006

Expected Completion Date: September 2011

The H1 working group met with 5 members and 4 guests in attendance, chaired by Marc Benou. Malcolm Swanson acted as vice chair.

The January minutes were distributed but there was not a quorum to approve the minutes. That will be done by email after the meeting. The March 2008 IEEE patent policy was distributed.

Draft 1.4, with the latest writing submittals was handed out. Draft 1.4's most significant changes are the format changes in an attempt to make it comply with the IEEE style manual. More work is needed to make it work properly with the IEEE template. Also, the references, tables and figures need to be updated to fit the style guide and template.

Mal Swanson had contributed a new introduction for Section 4. The group decided to simplify the introduction and Mal agreed to rewrite it. Section 4.2 will not be changed as previously decided but the reference will be updated.

There was discussion over the use of the word Teleprotection in the Guide and whether it is an approved IEEE word. Mal will check the IEEE dictionary and if it is not we would like to add it to the guide as a new word since it is believed to be widely used by the IEC.

Section 4.3.1.4 describes the G.703 interface. It does not include a connector and pin out drawing. We need to determine if the G.703 standard includes the physical interface and if not, determine if we can include one that is used as a common practice. David Gil will look into this.

Section 4.3.1.6 is to be written but is titled RJ-45. It is not believed that RJ-45 is the correct term and Jim Ebrecht volunteered to find out. Jim and David agreed to look into whether PLC muxes should be included in the mux section 6.4.

Marc and Jim need to communicate before the next meeting to come up with a strategy for Section 8.1 communication schemes and what to include.

H2: Broadband Communications Over Power Line Carrier

Chair: M. Simon

Vice Chair: TBD

Output: Report to the Subcommittee

The BPL Working Group did not meet.

H3: Time Tagging in Protection and Disturbance Recording IEDs

Chair: B. Dickerson

Vice Chair: Jim Hackett

Output: IEEE Recommended Practice

Established: Sept. 2006

The working group met on September 9, 2008 in a single session. Ten (10) signed in as Members and Eight (8) as guests. The meeting was chaired by Bill Dickerson.

The IEEE Patent Policy slides were shown, and an opportunity was given for attendees to disclose any patent issues. No such issues were identified.

No comments have been received on the minutes of the previous meeting, so they are considered to be approved as transmitted.

Vice-Chair Jim Ingleson asked the Chair to accept his resignation as Vice-Chair, considering Jim's retirement schedule. He was unable to attend the meeting this time, but intends to stay involved with the WG and PSRC activities as he is able. Jim I. recommended Jim Hackett as a replacement; Jim H. has agreed to accept the position which was subsequently approved by the H sub-committee.

Revised Draft 0.2 was discussed in the meeting, including a revised contribution from Aaron Martin regarding data interpolation, and a new table of definitions provided by the Chair. Comments from two WG members underscored the importance of getting agreement on common definitions before we can proceed further, as there exist many different interpretations of terms such as "time tag," "event time," and "reference time."

Most of the meeting was spent discussing these terms, and no consensus has been achieved yet on some of them, though significant progress has been made. The discussions will continue off-line with the goal of having an agreed set of definitions by the next meeting. The chair will also re-solicit members who have accepted writing assignments, but not yet completed them.

H4: Revision of C37.111 COMTRADE Standard

Chair: R. Das

Vice Chair: A. Makki

Output: Standard

Established 2006

The Working Group H4 met on September 9th, 2008. Thirteen members and ten guests were present and the minutes of the May meeting were approved.

The Vice-Chair started by giving a brief overview of the main proposed revisions including the new single file format (CFF extension), the new data types (binary32 and float32), and the new time-code-offset and time quality fields.

Discussions were then held on how the new data types affect the user's ability to calculate resolution and dynamic range. To that extent, an assignment to add a short paragraph that clarifies this subject was issued to two members and the due date was set for the end of September.

Discussions were also held on the proposed XML based COMTRADE format and on the format of the new time-code-offset field. The Vice-Chair circulated a ballot to the members to vote on these issues (due by the end of September) in order to finalize the proposed revisions and prepare the final draft for circulation to the subcommittee members in January of 2009.

H5-a: Common Data Format for IED Configuration Data

Chair: J. Holbach

Vice Chair: D. P. Bui

Output: Report

Prior to this IEEE-PSRC meeting in September, the WG met as a smaller group on the 30-31st of July in Raleigh NC to work out the outlines of the document to describe a distance protection function.

The group met in Vancouver Canada on September the 10th with 16 members and 7 guests.

The result of the Raleigh meeting where presented to the working group. The outline will become posted on our internet side and the manufacture, not able to participate at the Raleigh meeting are ask to review the existing outlines and contribute there unique settings into this outline.

The question how to keep the defined superset of IED configuration data up to data and revised became discussed. One possible solution was proposed. This solution would allow private settings for each user, which could be included in a revised version of the definition later. Further investigations are needed to decide on a practical solution.

Christoph Brunner volunteered to give during our next meeting a short overview about the IEC61850 description format and structure for configuration data.

The WG planes to meet again before the next IEEE-PSRC meeting in January with a smaller group. The possibility to combine the meeting with the WPRC to reduce travel efforts was proposed.

As preparation for this meeting, the Chair volunteered to develop an Excel sheet with all settings from all manufacture.

Alex Apostolov volunteered to propose a naming convention for the setting naming.

In parallel the differential protection function will become approach!

For the next meeting in January the WG wants to meet also on Monday the whole day.

H6 Substation Ethernet

Chair: J. Burger

Vice Chair: C. Sufana

Output: Report

The meeting was called to order by John Burger. There were 13 members and 41 guests present.

Minutes from the Kansas City meeting were approved as presented.

Christoph Brunner gave a short update on what has been happening with IEC61850 improvements. Version 2 of IEC61850 is to be released soon and has good backward compatibility. He also reported that work is being done on a draft report describing substation to substation communication.

Christoph Brunner also reported on the CIGRE B5 committee meeting. He reported about 5 papers were presented on the process bus. He indicated that there was much discussion relating to the process bus.

John Burger reported that there was a UCA Users Group Booth at the CIGRE meeting. He indicated that at the general and technical meetings were well attended with over 100 attendees.

John Burger reported on the status of the UCA Users Group. He indicated that the group now has over 100 paying members and that the group has CIM, Open AMI, and IEC61850 elements. He also said there was much activity related to smart grid.

John Burger indicated that he is looking for reviewers of the paper.

There was some discussion on future meetings. Herb Falk asked if H6 should have a talk on SCD applications. Herb was encouraged to follow up on the subject. AREVA T&D Canada will have a presentation on GOOSE. Alex Apostolov volunteered to present the paper; possibly at the Texas A&M conference.

Bogdan Kasztenny of GE gave a presentation on Process Bus Implementation. He stressed that the technology will be successful if it meets a business goal. He further said that material costs have been given much attention but now we must focus on all aspects of labor. Bogdan also said that the scheme must be secure and reliable.

The scheme Bogdan presented makes use of prefabricated cables used along with a fiber patch panel. The system is designed with IEC61850-9-2 in mind.

The relays use bidirectional transceivers using fiber. The scheme uses a hardfiber brick hardened switchyard interface. This Brick I/O to copper world meets IP67 mounting for outdoor gear and is self powered.

A Brick contains four MUs, containing 4 independent digital cores with direct point to point fiber. He indicated that there is no question on scaling up the number of bricks.

GE has built a pilot for AEP that has two 345kv lines with 3 busses, configured to duplicate existing protection. There are 12 bricks used for the 3 relays.

Bogdan explained that for retrofits, one needs to put everything outside of CB, no room inside, would need vibration ratings, etc. Thus for the Pilot, the bricks mounted on i-beam holding up bus.

The total count of equipment for the pilot is 12 merging units, 3 relays, 22 point to point connections, 2.72km of cable, and that the GE time on site was 0 hours

In summary he reported that for the process bus the architecture has:

- MUs (merging unit) to interface all switchyard I/O
- Point to point communication
- IEDs as synch masters
- Multiple MUs inside a physical device

H7 IEEE 1588 Profile for Protection Applications

Chair: Galina Antonova

Vice-Chair: Bill Dickerson

Output: Standard

Established: May 2008

The WG H7 met for the first time on September 10, 2008 in Burnaby, BC in a single section with 25 attendees (11 members and 14 guests).

After introductions a status update was given. It was noted that IEEE 1588–2008 standard was published on July 24, 2008 and its IEC version is expected by the end of 2008. IEC TC57 WG10 will adopt IEEE 1588 profile produced by WG H7, if completed in a timely manner. This will be in parallel with SNTP profile.

WG H7 PAR was submitted to NesCom in time for September meeting. Approved WG assignment and submitted PAR were presented to the group. Presentation of the PAR triggered a discussion on expanding WG H7 scope beyond protection applications. This will require a co-ordination with Substation Committee.

Two profile proposals were presented next. Roger Moore of RuggedCom gave an overview of IEEE 1588 and presented the main points of his proposal. In particular he explained that delay measurement mechanism is required to deal with network jitter. While the proposal covers the entire time distribution network, Roger suggested limiting it to within a substation.

Chris Huntley of SEL presented his profile proposal, which covers an Ethernet link to an IED. He emphasizes that time distribution networks are very complex and suggested to separate them from IEDs. Chris explained that IEEE 1588 standard has almost 300 pages, which are hard to comprehend and suggested to keep things as simple as possible.

Discussion of these proposals followed. Attendees expressed that while it is desirable to simplify things, both an interface to IED and time distribution network need to be included. One approach is to continue working on these proposals in parallel to pick strong points of both and make sure they will interoperate. WG members were asked to consider this as we continue work off-line.

Clemens Hoga of Siemens gave a presentation on Bumpless redundancy; this is an IEC TC57 WG10 Task Force. He stated that peer-to-peer delay measurements are required to support bumpless redundancy in the future and suggested these to be part of 1588 profile.

H8 File Naming Conventions

Chair: A. Makki

Vice Chair: R. Cornelison

Output: Standard C37.232

Completed: September 2008

Working group completed its work and was officially disbanded. H subcommittee chair thanked the WG chair A. Makki and the WG members for their hard work and standard contributions. Output of the H8 working group was published by IEEE in August of last year as C37.232-2007.

Summary paper was developed and presented at the Georgia Tech Fault and Disturbance Analysis conference in May of this year. The feedback was very positive and the standard is rapidly gaining popularity among users and manufacturers.

In addition, a member of the NERC fault analysis group stated that this work has significantly improved ("by more than 10 fold") their ability to manage and analyze fault records and that the vast majority of the records submitted to NERC today are in compliance with this standard.

WG chair would like to thank the members of the working group especially Jim Ingleson, Ken Martin, Tony Giuliante, Mark Taylor and Rick Cornelison for their excellent contributions to this work. These members were recognized along with the WG chair by the IEEE SA certificates of appreciation.

H9 Understanding Communications Technology for Protection

Chair: M. Sachdev

Vice Chair: M. Benou

Output: Paper

Established: 2006

Expected Completion Date: 2009

The H9 working met at 9:30 AM on September 10, 2008; thirteen members and sixteen guests were present. The progress in the contributions for the WG report was reviewed and the volunteers for the outstanding contributions were reminded to send their contributions to the Chair and Vice Chair before the end of October 2008 so that the first draft of the report be distributed before the next WG meeting in January.

The outline of the report was reviewed and several additions and modifications were agreed up on. The new outline will be distributed among the WG members for review and comments. Four new writing assignments were distributed.

H10 Naming Installed Intelligent Electronic Devices (IEDs)

Chair: R. Cornelison

Vice Chair: J. Hackett

Output: Paper

Introductions, 8 members, 3 guests.

John Tengdin made a presentation on changes to C37.2.

Christoph Brunner made a presentation on how IEC 61850 and IEC 61345-1 relate to device naming. Assignments were made.

H11 C37.118 Standard for Synchrophasors for Power Systems

Chair: K. Martin

Vice Chair: B. Kasztenny

Output: Standard

The WG met on September 10, 2008 with 12 members and 20 guests. The IEEE-SA Standards Board Bylaws on Patents in Standards have been brought to the attention of the WG.

The minutes of the May 2008 meeting have been approved as printed.

Ken Martin informed that the Transactions paper summarized the C37.118 will be printed in October 2008.

Ken gave an update on harmonization of the synchrophasor communication with IEC 61850. Work will be done to include synchrophasor data in the IEC 61850 communication framework.

Ken also reported on two items in the existing standard that will need to be explained or corrected in the next edition (byte count for long data sets, and wording in one of the informative annexes).

Ken reminded the WG about the two Task Forces, and summarized two proposals for the dynamic phasor definition and performance requirements (by Jerry Steinbacker and Ken Martin, respectively). Ken also shared a number of test results related to dynamic testing of various PMUs. These showed some discrepancies in the measurements.

Discussion followed. Jay Murphy asked about the meaning of the 1/3rd of the reporting rate as the upper limit for the modulation test in Jerry's proposal. An explanation was given regarding the pass band in the new standard and the existing stop band per the out of band frequency requirement in the existing standard. Veselin Skendzic brought up information about the preferred filter gain envelope as followed by WSCC.

Bill Dickerson discussed applicability of the proposed step change test.

Bogdan Kasztenny observed that most PMU are non-linear systems. Modulation tests at certain magnitude may not necessarily guarantee compatible responses under modulations of higher magnitudes.

Veselin brought the issue of frequency and the need for definition that would be in harmony with the dynamic phasor definition and performance criteria.

Bogdan commented that the modulation and step tests should be enough to ensure effective interoperability. Setting a limit on modulation frequency to about 5Hz should both be practical and acceptable from the point of view of current PMU technology.

Bill opened a discussion regarding mandated implementation as a method of achieving interoperability. Jay and Veselin took a position of avoiding this and achieving the goal via simple performance tests.

There was general agreement that including both step and modulation test requirements are a good approach to dynamic performance requirements.

Ken was encouraged to present modulation and step change test results for various PMUs with the intent to gauge performance of existing PMUs regarding possible accuracy levels in the new standard.

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

Chair: E.A. Udren

Vice Chair: J. Gould

Output: Technical Report

The Working Group met on September 10, 2008 with 29 attendees. The Chair and attendees reviewed the updated partial draft of the Technical Report, with new submissions by several WG members. Technical issues to resolve are noted in the markup of the draft entered during the meeting. WG members agreed to

review the draft in its present state and return comments and markups by November 5. Outstanding section contributions still expected are also noted in the draft.

H13 Understanding Requirements and Applications of the Substation Cyber Security Standards

Chair: S Kunsman

Vice-Chair: E. Udren

Output: Report

Established: January 2008

Meeting #3 – September 9, 2008 with 44 attendees total

Session 1 (Markus Braendle, Chair):

Sam Sciacca presented on the work of Substations Committee WG C1. He gave background information on the standard IEEE 1686 and an overview of the topics covered. He also talked about the future of the working group and possible next steps.

Scott Mix gave an update on NERC activities, using a presentation he prepared for CIPC the same week. He informed H13 that both the standards authorization request (SAR) and the standards drafting team have been approved by the NERC Standards Committee. He talked about the future plans of the standards drafting team and invited all PSRC attendees to participate in the process.

Markus Braendle gave a short update on ISA S99, Security for Industrial Automation and Control Systems, noting that the standard is also planned to be released as an IEC document. For an overview of the ISA development work, see: <http://www.isa.org/MSTemplate.cfm?MicrositeID=988&CommitteeID=6821>.

Session 2 (Eric Udren, Chair):

The session began with a discussion on how to coordinate the work of H13 with NERC CIP standards development activities - in particular their plans to write guidelines as part of their work. We also want to keep coordination with WG C1. There was a consensus among WG leaders that PSRC H13 and SC C1 should work together, and we agreed on a joint meeting in Atlanta. The NERC and PSRC/SC standards processes must run independently, but can exchange information.

This was followed by a discussion on the type of document H13 should produce – a PSRC technical report, a standard, or a recommended practice. The WG reached the surprising conclusion that the project should aim towards a Standard. This can be carefully crafted as a technical standard, coordinated with NERC CIPC's performance standards. Following practices in a standard does not guarantee CIP compliance; it was noted that no IEEE standard guarantees results and the legal situation is properly defined. A PAR can be submitted within 2-3 meetings, maybe less. Any cyber security PAR will go to SCC 14 and to NIST.

The WG discussed examples of what such a standard might contain. After the meeting, Sam Sciacca prepared example material to be posted on the WG web site to help get the project started. All participants should review the PSRC WG C1 report posted on the PSRC web site.

The WG will assemble a draft outline for Cyber Security Requirements for Substation Automation, Protection and Control Systems (or a later Standard title proposal) by November 5 with these volunteered contributions:

- Craig Preuss – overall objectives and structure
- Daniel Thanos - configuration management / trusted networks and trusted devices, point-to-point and chain of trust; multifactor authentication and false rejection
- Herb Falk - monitoring and active response
- George Gresko - Interface between substation LAN and business / corporate LAN
- Roger Moore - access control & authentication
- Mark Simon - operational challenges for users
- Mark Taylor - problem statements from utilities
- Jay Hicks - problem statements from utilities
- Tony Seegers – problem statements from utilities

Other topics that could be in the scope are:

- ESP definition
- Remote access
- System architecture
- Staffing requirements
- Security event analysis

H14 Telecommunications Terms Used By Protection Engineers

Chair: R. Ray

Vice Chair: R. Young

Output: Report

Glossary of telecommunication terms for protection engineers was completed and posted on the WEB on the H14 WG page. After completing the work, chair asked for permission to disband. Motion was unanimously approved by the H subcommittee.

H15 Coupling Redundancy for Protection systems Using Powerline carrier

Chair: R. Ray

Vice Chair: TBD

Output: TBD

Working Group did not meet.

H16 Common Format for IED Event Data

Chair: Marc Adamiak

Vice Chair: Pierre Martin

Output: Standard

Established: September 2008

The WG met in Vancouver on September the 10th , 2008 with twelve attendees. This was the first H16 meeting. It was explained that the WG is at the moment a study group whose goal is to define the scope and the purpose of a new PAR. The project is to use the report issued by the former H5b WG as the basis for a new standard. This report is being circulated to the H subcommittee for comments and approval. The name of the project would be COMFEDE for Common Format for Event Data Exchange.

A summary of the work done by the H5b WG was presented after what the group reviewed the proposals for the scope and the purpose of the PAR. After some discussions and minor corrections, the group agreed on the proposals. To the question: Are there other standards or projects with a similar scope?, the project PQDiff was mentioned. After discussion, differences were identified, for example the required setting group information associated with an event. Finally, the attendees present at the meeting concluded that there was no conflict between both projects.

There was also a discussion on the definition of an event. It was reminded to the attendees that the WG will take into consideration the work in progress by the H3 WG which deals with all issues related to a timetagged event. A question was raised on the relevance of asking for a Trial Use PAR instead of a Full Use PAR. It was explained that not so many manufacturers have commented the H5b report. The group will need feedback from the industry and a Trial Use PAR is the method to obtain this response.

Finally, an issue was raised on the possibility of requiring copyright permission from the IEC because the common format reuses some definitions from the IEC 61850 part 6 "Configuration description language for communication in electrical substations related to IEDs" . The group considered that it was not an issue as long as the future document can refer to other standards.

HTF1 Application of COMTRADE for Exchange of Synchrophasor Data (New taskforce)

1. **Chair: Ken Martin**
2. **Vice-Chair: Eric Allen**

Output: TBD

Established: September 2008

Assignment: Investigate issues related to the use of COMTRADE for exchange of Synchrophasor Data. Develop a profile (scheme) to use COMTRADE for this purpose. Report on other formats that have been used such as “.dst.” Address issues that would arise in converting .dst and other formats to COMTRADE.

Task Force met on Sept 10, 2008 with 8 members and 8 guests.

Ken Martin presented a proposed profile for placing phasor data into COMTRADE format. This profile requires no changes to the COMTRADE standard; it proposes a convention for representing phasor data in the existing COMTRADE standard. If this approach is followed, then the end product of the group would be an application guide for users to place phasor data into COMTRADE.

There was initially a general agreement that COMTRADE is the appropriate format to use for exchanging phasor data. It is the existing standard for transferring dynamic data and is general enough to accommodate phasor data. However, agreement on use of COMTRADE as the standard to use for exchanging phasor data was not completely established; an alternate data format, PQDIFF, was also suggested. Ken Martin provided an overview of the .dst format used commonly in WECC. A consensus that phasor data is transient data (and hence covered by COMTRADE) was not reached.

The primary issue with using COMTRADE for phasor data is that this data consists of complex values and hence requires two analog channels to convey the entire quantity. The .cfg file, as presently defined by C37.111, does not indicate that a particular pair of channels represents a complex quantity. It was noted that phasor data may be provided for all three phases, for positive sequence quantities only, for positive, negative, and zero sequences, or for a single phase only which is being used as a proxy for positive sequence.

Using Ken's proposal, the ccbm or uu fields could be used to identify a channel as a phasor. There might be a need to standardize such designations in the COMTRADE standard. Using “n” as the second character of the phase field could be used to indicate a real (non-complex) analog quantity; alternatively, the absence of “r,” “i,” “m,” or “a” (which are defined in Ken's template) in this position could also be interpreted as a non-complex value.

A major question, still to be decided, is whether the upcoming COMTRADE standard should be modified or expanded to specifically identify complex channel quantities. The fact that the COMTRADE standard is currently being updated provides an opportunity to include enhancements for phasor data and complex values. It was noted that IEC 61850 is examining the use of vector data types.

One proposal for COMTRADE modification that received significant discussion was to add a third channel type, “P,” to the second line of the .cfg file. This third type would be used to identify the number of phasor quantities. A number of variations of this idea were discussed, including the use of “P” for polar complex quantities and “R” for rectangular complex quantities. This proposal could cause problems with existing programs that read COMTRADE, particularly if the new fields are not placed at the end of the .cfg file.

Another suggestion was to use the header file (.hdr) to identify the data as phasor data.

A phasor quantity has three attributes:

- Polar (magnitude/angle) or rectangular (real/imaginary) representation
- Integer or floating point numbers
- Frequency of the phasor representation

Using COMTRADE to convey information from multiple PMU stations (such as a Phasor Data Concentrator (PDC)) raises additional issues about station names and commonality of time scales. Station names ordinarily appear in the first line of the .cfg file; if output from a PDC is desired, the station name would need to be identified for each channel.

Questions about file size were raised.

In summary, there was much discussion at the meeting, but no consensus on major issues was reached.
Key questions to be answered:

- Is COMTRADE the appropriate format to use for exchanging phasor data?
- Which version of the COMTRADE standard is being considered?
- What indicates that the data in COMTRADE is phasor data?

Liaison Reports

PES Substations Committee

J. Tengdin

PES Substations WG C2 – In Process Update of IEEE 1613 – 2003 Standard Environmental and Testing Requirements for Communications Networking Devices In Electric Power Substations and

WG C5 – Completed Update - now C37.2 – 2008 IEEE Standard Electrical Power System Device Function Numbers, Acronyms and Contact Designations

P1613 – The Invitation to Ballot is open until September 19, and the 30 day balloting period is scheduled to open on September 20. At the Substations WG C2 meeting on Monday, there was much discussion about the changes from the original 2003 version to expressly allow cooling fans in these devices. There was a notable lack of support for this change by those who attended the WG meeting.

C37.2-2008 was approved by the IEEE SA Standards Board at its June meeting, and publication is expected by the end of September 2008. There will be a detailed presentation on C37.2-2008 at the Main Committee meeting on Thursday. There are numerous additions to this standard (first published by AIEE in 1928), so the Working Group is planning an outreach program to bring these changes to engineers in industry. The plan is to send a short (5-6 page) summary of the changes plus supporting PowerPoint slides to the local chapters of PES and IES as a possible program that could be produced locally. Since their members were Email participants in the Working Group, it is also planned to send this material to the offices of the Industry Applications Society's Power System Protection Committee and its Rural Electric Power Committee, and to the IEEE Rail Traction Standards Subcommittee. Copies of the Word document and the slides are attached.

PES Communications Committee

S. Klein

No report.

TC57, WG10, 17, 18 and 19

Ch. Brunner

No report.

Old Business:

Correction and approval of H SC minutes (May 2008): Minutes were approved with the following addition: Taskforce HTF1 was created and tasked to investigate issues related to the use of COMTRADE for exchange of Synchrophasor Data.

New Business:

- PES would like to offer industry wide tutorials (1/2 day) on topics of interest and is looking for material.
- WG chairs were warned about the need to ensure non commercial nature of the WG presentations and the need to leave sufficient time for questions / discussion.
- WG chairs were reminded that all groups developing standards need to start with IEEE Patent policy / Intellectual Property disclosure slides.

- WG overlap was discussed. As a result, 3 working groups requested to be moved to Tuesday morning
- WH H8 was disbanded after successfully completing the Standard and the associated overview paper. Paper will be posted on the PSRC WEB site.
- WG H114 was disbanded after successfully completing the "Glossary of telecommunication terms for protection engineers". Glossary is posted on the H14 WG page.
- WG H3 asked that Vice-Chair Jim Ingleson be replaced by Jim Hackett (Jim Ingleson is retiring and may not be in position to attend all meetings). Motion was approved.

I: RELAYING PRACTICES SUBCOMMITTEE

Chair: T. Sidhu

Vice Chair: R. Beresh

The Subcommittee met on September 10, 2008 with 23 members and 16 guests.

- Approval of previous I minutes from Kansas City 2008 – approved
- I8 was dissolved and re-formed as I11. The WG name was changed to "Guide for the Application of Optical Instrument Transformers for Protective Relaying" and they requested a change from the previous 4:30pm time slot.
- I14 requested to be disbanded and that a TF be formed to proceed with additional work (promotion/dual logo of C37.2). The new TF was formed as ITF2.

Reports from the WG Chairs

I1: Understanding Microprocessor Based Technology Applied to Relaying

Chair: Mohindar Sachdev

Vice Chair: Ratan Das

Output: Report to the Main Committee

Expected Completion Date: 2008

The Working Group did not meet during the PSRC meetings in Vancouver. The WG report was submitted to the I Subcommittee members and only two comments were received. The suggested changes were made and the report was submitted to the PSRC Officers. Miriam Sanders and Bob Pettigrew approved the report. Charlie Henville provided comments and the report has been modified to take care of those comments. The report will be resubmitted in a couple of days to Charlie for approval.

Next meeting: The WG does not plan to meet during the January 2009 PSRC meeting.

I2: Terminology Review

Chair: Mal Swanson

Vice Chair: Barb Anderson

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

Meeting: Sept 8, 2008

The I2 working group met at 11:00 am on Tuesday, September 9, 2008 with six members and two guests. Mal Swanson chaired the meeting.

Minutes from the last meeting were approved.

As a note, I2 has caught up reviewing all of the available guides and standards.

Mal covered the problems we are having with getting our words into the IEEE 100 Dictionary through C37.100. We are having definitions updated on the PSRC website after each meeting so that they will be available to the membership.

C37.234: Oscar discussed the term, "end-fault protection", with the Chairman of that working group to see if it should be "blind spot protection". However, the section that used this term has not been finalized, nor has a diagram been completed. This issue will be discussed by that working group at some later time. Oscar will continue to follow this.

The working group discussed the term, "fault bus protection", and approved a definition to be added to Group #6.

John Tengdin reviewed the work of C37.2, which has 17 acronyms that are not yet in the IEEE Dictionary. John will email Barb Anderson a copy of his "talking points," which she will email to I2 members with the minutes.

C4 Working Group paper: The working group reviewed several of Roger Whittaker's revised definitions from this document, which will be added to Group #6. Work will continue on the rest of these definitions at the January, 2009 meeting.

Barb Anderson will have the newest revision of Group #6 added to the website and emailed to working group members and Russ Patterson as "DND6019".

The meeting was adjourned at 12:20 pm.

I3: Relay Functional Type Testing

Chair: Jerry Jodice

Vice Chair: Bryan Gwyn

Output: Report

Meeting: #3 – September 9, 2008

The third meeting of I3 included 16 participants, with the recognition that more follow-up is required by the Officers to insure assignments are fulfilled on schedule

KEY ISSUES

1. At this time there is a backlog of four event-based reports overdue. It was determined an agenda will be issued two weeks prior to each meeting as a reminder of commitments.
2. Of highest priority is the review of, and comments on the Drew Wilton created Report Format
Objective: A consistent format will allow convenient access to the library as it grows in depth, and a search engine for this purpose is implemented.
3. Prior assignments included a review of language used in both reference documents [CIGRE & PSRC] to insure a consistent language ,based on prior work.

Mel Swanson's WG will be requested to review & comment.

ASSIGNMENTS

A. Tony Giuliante will investigate options for reissuing/access to presentations from various relay symposia. Recent presentation from both WPRC & TX A/M are of interest.

B. The Chair will re-issue all prior Reference Materials, together with all WG assignments {both those that have been presented & those in backlog to insure everyone is on the same page.}

DISCUSSION

Info sources, discussed at I3:

**Are the NERC disturbance Reports available? Who should be contacted?

Tom Weideman, Phil Winston, and Bob Cummings will be contacted for their advice.

**Should the Bob Dempsey & Tony Giuliani "Ask the Experts" forum be reactivated as a means to provide info on current-day practices?

**With the level of interest in "Basics of Protection" due to new staff, should some process to re-issue past work be initiated??

The Chair recognizes the level of interest in this subject, and requests I.SC and Main Committee guidance, especially regarding access to prior PSRC reports.

I4: IEC Standards Advisory

Chair: Eric Udren

Vice Chair: Mario Ranieri

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

WG meetings are continuing

The WG met on September 9. We discussed the following TC 95 documents, some requiring a vote from USNC:

- 95/238/CD – 60255-127 - Functional standard for over/under voltage protection (first draft) (vote October 17) – The structure is similar to -151, but only one curve shape is shown. See if this is suitable for known applications of inverse-time overvoltage or undervoltage functions.
- 95/235/CC and 95/236/CDV – 60255-151 –Functional standard for over/under current protection (vote November 14) (comments on prior CD, and new CDV) – This has been discussed at prior meetings, and looks good.
- 95/237/RVC and 95/239/FDIS – 60255-11 Ed. 2 - Voltage dips, short interruptions, variations and ripple on auxiliary power supply port – vote September 19 - The test suite now includes checks for a full range of auxiliary power supply quality problems, including short interruptions to zero or partial voltage, and longer interruptions. Ripple of 15% is specified at power frequency or twice power frequency. The test includes gradual ramp up and down of supply, and reversal of supply polarity. Depending on the problem, the relay must ride through the disturbance with no functional impact, or temporarily cease operation and resume when the supply is restored. The WG decided in May to cast a favorable vote, with a request for declaration by manufacturers of how long "temporary" is (typically, relay reboot time). This US comment was rejected and the subject clause reworded in a way that does not call for declaration of reboot time. The WG accepted to vote in favor, not arguing over this issue, and this vote has been submitted.
- 95/234/RVD result on 95/230/FDIS – IEC 60255-26, EMC Requirements - For RF immunity and ESD tests, IEC has less demanding compliance levels than IEEE C37.90.2 and .3. For RF, IEC requires 10 V/m modulated, while IEEE calls for 18 V/m modulated & 35 V/m unmodulated field strength. The IEC test is thus not a challenge for manufacturers testing to IEEE levels, and the US has consistently viewed it as inadequate and has voted negatively. We cast a vote against this final standard with explanation; the standard passed and the vote tally is published.
- 95/241/RVC and 95/242/FDIS – IEC 60255-22-5, [Lightning] Surge Test – vote October 31. This is a high-energy surge with slow rise and fall and large energy content. This is not like any IEEE surge test, and not representative of conditions in a substation control building. It would be a good test for a device connected on a distribution feeder near where lightning might strike. IEC requires this sort of surge test in general for electronic devices. The US will vote in favor unless we hear points to the contrary

- 95/240/DA – Draft agenda for TC 95 meeting in Sao Paulo, Brazil in November – Murty Yalla will attend for the US National Committee.

TC 95 would like to meet at the IEC General Meeting in Seattle in 2009 and asked for US National Committee support. According to USNC, we would have to raise about \$18,000 to host this meeting, probably from supportive vendors and utilities. The WG asked the Chair to go back to USNC and find out why so much. This is a tough target, and the deadline is not known – the Chair needs to inquire of some relay vendors and others to see if we can approach this goal.

Not reviewed at the meeting were TC 57 WG 10 documents for IEC 61850, Edition 2:

- Part 7-1: Basic communication structure for substation and feeder equipment - Principles and models - Revision project initiated and CDV circulated with vote due in October.
- Part 7-4: Basic communication structure - Compatible logical node classes and data classes – CDV with vote was due in August.
- Part 7-2: Basic information and communication structure - Abstract communication service interface (ACSI) – Comments on CD circulated; new CDV circulated with vote due in October.

WG I4 will meet in Atlanta in January – 15 attendees and computer projector.

I5 Schematic Representation of Power System Relaying

Chair: Kevin Donahoe

Vice Chair: Dave Zinn

Output: Report

Meeting: #4 – September 10, 2008

The Working Group met for the fourth time for a single session with 15 members and 8 guests totaling 23 attendees on Wednesday, May 14, 2008.

We started off with a review and approval of the minutes from May, followed by introductions and discussion of proprietary and patent information. We reviewed that at present the assignment of the Working Group is to produce a report.

Karl Zimmerman gave a presentation on the commissioning of logic based protection schemes. It was noted that previously schematics would be used extensively to perform commissioning with certainty. Logic based schemes require new tools.

Lively discussion of both the presentation and new issues followed and were used to add to our working table of contents. It was also requested that members find time to look at C37.2 and come to the January meeting to discuss how and which new terms might be good to incorporate.

Next meeting Jim O'Brien and Jim Platt are scheduled to give presentations and we will discuss a sample schematic from Jeff Long.

WG will need a meeting room accommodating 30 along with a projector.

I6: Guide for

Chair: Ljubomir Kojovic

Vice Chair: Bob Beresh

Output: Guide

Meeting: #1

WG I6 met with 11 people. In Lubo's absence Bob Beresh led the WG meeting. Lubo's outline was reviewed and received by the WG as a good starting point. There seems to be enough interest in this work

to proceed. No assignments were handed out but work can begin by distilling some of the information from the previous document into the appropriate sections given in the outline.

I8: Guide for Applications of Optical Current & Voltage Systems

Chair: Harland Gilleland

Vice Chair: Bruce Pickett

Output: Guide

Meeting: September 9, 2008

- The meeting was called to order by the Chair Harley Gilleland. There were 10 members and 2 guests. All members and guest were introduced. Issues that need attention were discussed – they included the new Team Leaders – Michael Mendik for “Application Issues” and Farnoosh Rahmatian for “Performance”. – and Michael Mendik will be the WG Webmaster and interface with the SC Webmaster.
- There was in-depth discussion on the strategy for accelerating progress in developing the Guide – focusing on the four Sections of the Guide where the most support is needed. The strategy includes using the PSRC Core group and electric utilities with experience in optical sensor technology for developing the Guide.
- We discussed that we are asking the Subcommittee to dissolve the I08 Working Group – and establish and approve a new Working Group with a new number. The new Working Group would develop a Guide for “ The Application of Optical Instrument Transformers for Protective Relaying”
- The Working Group also request that our meeting in Atlanta be rescheduled to the 11:00 am time slot on Tuesday to avoid conflict with other Working Groups in the 4:30 pm slot which keeps some of our key members from attending the I08 session.

I9: Revision of C37.105 Standard for Qualifying Class 1E Protective Relays and Auxiliaries for Nuclear Power Generating Stations

Chair: Sahib Usman

Vice Chair: Roy Ball

Output: Revision of Standard C37.105

The WG did not meet

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

Chair: Marie Nemier

Vice Chair: Munnu Bajpai

Output: Revision of Standard C37.98

The WG did not meet

I14: Revision of C37.2-1996 Device Function Numbers

Chair: John Tengdin

Vice Chair: D. Holstein

Output: Revision of Standard C37.2-1996 joint with Substation WG C5

Meeting: May 14, 2008

The PSRC WG I14 met in a joint session on Tuesday with Substations WG C5. The basic assignment of the joint working group has been completed, and IEEE C37.2-2008 was approved by IEEE SA Board at its June 2008 meeting, and publication of the document is expected by the end of September. John Tengdin

will make a presentation at the Thursday Main Committee meeting describing the substantial changes in the 2008 revision. Those are summarized in the attached "Talking Points" document and PowerPoint slides that we ask be posted on the I Subcommittee web site. What remains is to publicize this revision with information to the local chapters of PES and IAS. John Tengdin will make the first of those summary presentations on September 18 in Orange County, CA. In addition, he is the keynote speaker (on the topic of the C37.2 changes) at the Nuclear Relay Conference in San Diego on September 24.

This 2008 revision includes a detailed three page cross reference table to IEC 61650, and thus the joint working group feels that C37.2-2008 is an ideal candidate for the IEEE SA Dual Logo Program. Since this task is beyond the original assignment of Working Group I14, we ask that WG I14 be abandoned as its task is complete. The PES Substations Committee will explore how dual logos are created and, if necessary, ask PSRC I Relaying Practices Subcommittee to establish a Task Force for liaison purposes for this effort. At this writing, no meeting of I14 nor its offshoot task force is planned for the Atlanta meeting.

I15: Revision of C37.110 – Guide for the Application of Current Transformers Used for Protective Relaying Purposes

Chair: George Moskos

Vice Chair: Barry Jackson

Output: Revision of Standard C37.110-1996

Meeting: September, 2008

Working Group I15 meet at this meeting. The working group met with only one member. We discussed what is required to write a Summary Paper. The IEEE SA Standards Board approved the standard on December 5, 2007. IEEE Standard C37.110 -2007 was published on April 7, 2008. Beginning at September 2008 meeting, the working group will meet to start on the Summary Paper.

I17: Trends in Protective Relaying Performance

Chair: Mark Carpenter

Vice Chair:

Output: Periodic Reports to Subcommittee

The working group met with 4 members and 9 guests on Tuesday September 9, 2008. The existing report covers 7 years of data from 2000 through 2006. Eight companies participated in all or a portion of the years. The largest participation was 7 companies in 2001; the smallest participation was 2 in 2006. The 2007 data will be gathered prior to the January meeting and will be published as a report on the subcommittee web site. In the meeting Oncon presented additional breakdowns of the data for Oncon and the changes that Oncon has made over this time period to improve performance.

I18 Anomaly Checks for Relay Settings

Chair: Peter McLaren

Vice Chair: Mukesh Nagpal

Output: Report to main committee

Meeting: # 4 – September 09, 2008

The WG met for a single session with 8 members and 12 guests

The WG set out to consider the draft questions for manufacturers but made no progress beyond the first question which concerned the security of access to the relay. Manufacturers felt that security was not within the remit of the WG, nor conveyed in the title of the WG. This led to a discussion of the purpose of the WG during which we heard that relay engineers were having a tough time (overwhelmed) with the setting process and anything which helped to avoid wrong settings would be welcome. There was general agreement that, as things stand, if an unauthorized person gains access to the relay through its setting

software there was nothing which could prevent wrong settings getting on to the relay. The Chair felt that there at least should be some means (a shell) for recognizing ridiculous or random settings as might be imposed by a hacker but agreed that a 10% change in a setting would be impossible to detect by such means. Some engineers did not want to see any restriction on their ability to set the relay as they saw fit.

The draft of questions for manufacturers will be revised in the light of these discussions and considered at the next meeting.

We will meet for a single session at the next meeting, 20 people and need a CP.

“The WG will produce a report on relay software features and setting practices which minimize the possibility of wrong settings being downloaded to a relay. The WG will commence its task by conducting a survey of relay manufacturers and utilities to get information on present practice.”

I19: Protective Relaying and Redundancy

Chair: S. Ward

Vice Chair: B. Gwyn

Output: Report to the main committee

Estimated Completion Date: Sept 2009

Meeting #2 – May 13, 2008

Assignment: Produce a special report addressing redundancy considerations for relaying.

Output: Report

Completion date: September 2009

The Working Group met for a single session with 21 members and 17 guests in attendance on September 9, 2008.

We had an update on the NERC SPCTF reliability draft standard by Jon Sykes. It was decided that this future standard will not be referenced in the paper, but the applicable wording from the old standard.

The SPCTF standard is supported by a technical paper that is in draft form, to be finalized in the November time frame. We will extract information that may complement our report and incorporate it in our document.

Draft 5 of the report was reviewed and only a few writing assignments are still outstanding. Chair will prompt for the missing sections. Assignments for review of sections were handed out and the final review process is planned to start at the January meeting.

The report is about 90% complete. Changes made at the meeting will be incorporated into Draft 6 that will be sent out all members with the minutes. Outstanding assignments are due to the Chair by December 15.

The working group will meet in January for a single session, 30 people, with computer projector, to start final review of the report.

I20: Revision of C37.90.1 SWC Tests

Chair: Tom Beckwith

Vice Chair: Jeff Burnworth

Output: Periodic Reports to Subcommittee

Output: Revision of C37.90.1 SWC Tests Standard

Meeting: September 9, 2008, Vancouver, BC

The fourth meeting of the Working Group (WG) I20 met on September 9, 2008 in Vancouver, BC in a single session with 10 Members, including 1 new member, and 3 Guests.

The chair showed the slides of the Highlights of the IEEE-SA Standards Board Bylaws on Patents in Standards.

Due to work and pending retirement, Tom Tennille has resigned as Vice Chair. Jeff Burnworth volunteered to serve in his place.

The Minutes of Meeting #3 in Kansas City on May 13, 2008 were approved as submitted.

Review of IEEE PC37.90.1 Draft 3 edits.

The Working Group reviewed the initial changes from Draft 2 to Draft 3.

Review Working Group Assignments

Tom Beckwith presented a proposed revision of the Note from Example 1 and 6 of Annex D. The Annex D revisions should now be complete.

Barb Anderson reported that, in a comparison of the terms appearing in "Clause 3. Definitions" of our standard with those listed in *The Authoritative Dictionary of IEEE Standards Terms*, 7th Edition, some terms are listed and some are not.

Barb will continue to review the document for consistent usage of terms as defined in the Definitions and as employed in the Standard.

Barb Anderson volunteered to import the present Draft 3 into the IEEE Standards Template and begin using this tool to identify any changes necessary to comply with the latest 2007 Style Manual.

Coordination issues with other standards.

Bob Beresh is a member of P1613-2003 Environmental and Testing Requirements for Communications Networking Devices in Electric Utility Substations and will continue to report on any coordination issues between the two groups.

To coordinate with the IEEE Transformer Committee, Tom Beckwith contacted Craig Colopy, the Chairman of C57.15 IEEE Standard Requirements, Terminology, and Test Code for Step-Voltage Regulators, which cites C37.90.1-2002 in the "Control system requirements". Tom will continue to keep his working group informed of I20 activities. This was particularly timely as they are considering seeking dual IEEE/IEC logo for their standard.

Tom Beckwith presented a brief review of the deviations to IEC Standards that were identified in C37.90.1-2002, Annex E.

Jeff Burnworth presented the comparison table Mario Ranieri and he created that identifies the differences between the latest versions of the appropriate IEC Standards to IEEE Std C37.90.1-2002. Discussion was initiated with the IEC requirement to apply the oscillatory waveform with both a positive and negative 1st cycle polarity. The WG does not see adequate reason to test in both polarities, but conclude to formulate a request to IEC to provide an explanation. A formal request to the appropriate IEC Technical Committee will be generated following the completion of the review, in order to include all issues.

After the January 2008 meeting, an Explanation was submitted in response to a "Request for Interpretation of C37.90.1-2002". Tom Beckwith reviewed the response and determined how Clause 8.2 Common mode tests and Clause 8.3 Transverse mode tests may be edited to improve clarity.

Working Group Assignments

Barb Anderson to import the existing draft standard into the latest IEEE format.

The Working Group was asked to carefully review and comment on the comparison tables generated by Jeff Burnworth and Mario Ranieri.

Requirements for next meeting in January: Single session; 20 attendees; Computer Projector.

ITF1 Manufacturer's Service Letter Database

Chair: Jerry Jodice

Vice Chair:

Output: Service Letter Database

Meeting: September 10, 2008

Discussion at I TF1 meeting of 10 September resulted in the following actions:

1. This TF effort should be recognized by the "Long Term Planning" group as an ongoing task force, the scope of which may change depending upon limitations imposed by NERC, by commercial inter-utility concerns, and by copyright.{other rule-making bodies?}
2. Many prior attendees have not received copies of Minutes. Chair will send any useful prior presentation materials& the September -08 Minutes.
3. Charlie Henville will be asked to contact those relay manufacturers offering product in North America & request a bibliography of "Advisories" for PSRC Member use.

There is no question about the value of older advisories due to the large number of electromechanical relays which remain in service. There are about 60 available now. At present there are no advisories on newer [solid-state]designs, nor on numerical relays.

4. Bob Dempsey and Jeff Pond will locate the files of advisories at their respective companies, and provide copies for the I TF1 library.
5. The Chair will resend Doble portal access directions to everyone who has attended past sessions to insure availability of info.

ITF8 Revision to C57.13.3 - Guide for Grounding of Instrument Transformer Secondary Circuits and Cases

Chair: B. Mugalian

Vice Chair: Bruce Magruder

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

Expected Completion Date:

The Task Force ITF8, Revision of C57.13.3 - Guide for Grounding of Instrument Transformer Secondary Circuits and Cases, met in Waterford II, Hilton Vancouver Metrotown, Burnaby, BC, Canada on September 10, 2008. Two members and four guests were present.

The Task Force discussed the plan to review the relevant IEC standards related to the grounding of instrument transformer secondary circuits and cases. The Chair will contact Eric Udren to obtain a contact for IEC work in this area. The Task Force has a list of IEC documents to review to find relevant information. The Chair will assign each member a group of IEC standards to study. The Task Force will need two more sessions to develop an outline of work, and will submit a proposal to the I Sub-Committee for review. If the proposal is accepted, a working group will be formed.

Rich Young has become a member of the Task Force.

The Task Force will meet in Atlanta in January 2009 to discuss the outline of what sections of the guide can be revised to include the applicable IEC standards. We will use the Wednesday 8:00 a.m. time slot, room for 25 people, and will need a computer projector.

At the conclusion of this business, the meeting was adjourned,

Liaison Reports

The Instrument Transformer sub committee will next meet in October. No change in (C 57.13) since last PSRC meeting report.

Coordination Reports

None

Old Business

None

New Business

None

J: ROTATING MACHINERY PROTECTION SUBCOMMITTEE

Chair: W. G. Hartmann

Vice Chair: K.A. Stephan

J: ROTATING MACHINERY PROTECTION SUBCOMMITTEE

Chair: W. G. Hartmann

Vice Chair: K.A. Stephan

The Subcommittee met on 9/10/08 with 15 members and 12 guests. There was no quorum to approve the minutes from the May 2008 meeting and the chair will send a request to approve the minutes through email.

Reports from the WG Chairs

J1: Protection Issues Related to Motors Connected to Adjustable Speed (Frequency) Drives

Chair: J. Gardell

Vice Chair: P. Kumar

Established: 2003

Output: Report to the Subcommittee

Expected Completion: Dec 2008

Status: Draft 8 (Final)

1. The Working Group met for a single session with 7 Members and 1 Guest on September 9, 2008.
2. The Kansas City Minutes of Meeting #15 were approved.
3. The main effort for this meeting was to report to the Working Group the status of the final paper.
4. Steve Conrad will finalize the Table of Contents by September 23, 2008.
5. Jon Gardell will coordinate with the Terminology Working Group. He will check with Mal Swanson on how to specifically handle definition usage in this report versus IEEE 100.
6. The goal is to send the Working Group and the J Subcommittee officers the final report for placement on the PSRC website. A courtesy copy will be sent to Charlie Henville to provide him with how the Working Group addressed his comments.
7. This submittal is targeted to be completed by the end of September 2008.

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 2A

The J2 Working Group on Protection Considerations for Combustion Gas Turbine Static Starting met for its Tenth meeting in a single session yesterday (September 9th, 2008) with 9 Members and 4 Guests in attendance.

After introductions and approval of May 2008 meeting minutes, Draft 2a of the report was discussed and assignments made to revise figures in the paper for better consistency and to match format used in other Committee documents. Section IV.A.1. Low Frequency Response Figures 5 and 6, and descriptive text, will be revised by Dale Finney for clarity. Section IV.A.2.B. Drive Mechanism Protection will be revised by Mike Reichard to replace Manufacturer A and B figures (Figures 7 & 8, respectively) with a single generic oneline diagram (similar to the one used in WG J1) and list each manufacturers drive protections. Section IV.A.2.C. Generator Protection will be revised by Mike Reichard to follow the practices of Manufacturers A and B of the previous section.

J4: Revision of C37.102 AC Generator Protection Guide

Chair: M. Yalla

Vice Chair: K. Stephan

Established: 2000

Output: Guide

Status: Published

The Working Group met on Tuesday, September 9, with 8 members and 4 guests.

The Working Group continued to work on a summary document for the recently published Guide. Prior to this meeting, a straw vote was sent to the working group members asking, "Should an IEEE Transactions Paper be created as the summary document?" The results of the straw vote were 11 YES and 12 NO.

It was decided to create an Abstract to supply to the regional relaying conferences about the revised C37.102. If there is favorable response, the presentation used in the PSRC Main Committee will be enhanced for a 30-45 minute presentation at regional conferences.

The J Subcommittee will pursue other ways of announcing the revised Guide through various IEEE entities.

The working group assignment is completed and it was disbanded.

J7: Revision of C37.101, Generator Ground Protection Guide

Chair: J.T. Uchiyama

Vice Chair: R. Das

Co-Vice Chair: Mike Reichard

Established: 2000

Output: Revised Guide

Status: Completed

The Working Group did not meet this session.

J8: Generator Tutorial Revision

Chair: Michael Thompson

Vice Chair: Chris Ruckman

Established: 2007

Output: Tutorial (published by PSRC)

Expected Completion Date: TBD

Status: Draft 0.2

The Working Group met for a single session with 17 members and 4 guests on September 10, 2008.

Phase one output will be a special publication of the PSRC and published on the PSRC website. Phase two output will be an eight-hour tutorial presentation. An expected date of completion for phase one is 2009. We are presently on draft 0.30.

The minutes of the May, 2008 meeting were approved during the J subcommittee meeting.

The chair emphasized that the focus of all authors should be on the updated source documents and not simply modifying the original document. The original document is only a source of reference.

Russ Patterson has set up a website for the J8 working group. The website includes meeting minutes and other useful information. The website also includes a secure section that is only available to the working group. The tutorial documents will be placed on the website to eliminate problems encountered with

emailing large files. M. Thompson will email the password to the working group members after the September 2008 meeting.

SEL has agreed to provide the working group with technical document specialist (TDS) support for the tutorial documents. The TDS work will be completed as the last step of the process. It was recommended by several members of the working group to use “track changes” in the Word document. This will allow the author to review the recommended changes and ensure that the grammar recommendations do not change the technical content. The TDS can also provide support to convert sketches and scans to a Microsoft Visio file format for incorporation into the tutorial.

M. Thompson requested that all word document files be saved in an Office 2003 format to allow the majority of the working group to access these files (most of the group has not updated to Office 2007). Office 2003 files are saved with a .doc extension. Office 2007 files are saved with a .docx extension.

M. Thompson noted that the two column format was preferred but suggested that members work in the format with which they are most comfortable. Sections prepared in a single column format can be converted at a later date by the TDS group.

Chair reported that drafts for nine chapters have been submitted or revised since the last meeting. Reports were given by the authors on the individual sections:

- Section 1 – C. Mozina added a discussion of hybrid grounding to the section. He has also added the appropriate references regarding hybrid grounding. At this time, C. Mozina has completed this section and is ready for peer review. This chapter is ready for Z. Bukhala to perform the peer review.
- Section 2.1: Stator Phase Fault Protection – D. Finney reported several changes that have been made to this section. Dale added a section on CT saturation and referenced C37.110 for proper CT selection.

A paragraph was added that indicates some relay manufacturers include algorithms that can detect CT saturation and maintain security.

In the differential protection portion of the section, Dale added a dual slope protection write-up and graph. Dale also added a high impedance differential section. Several members of the working group questioned whether this type of protection is used. M. Thompson recommended that this be removed from the section if this protection is not commonly used. C. Mozina indicated that some companies in Europe use high impedance differential protection. M Yalla will check with CIGRE contacts on how common this protection is today and report to D. Finney and based on the results, Dale will determine whether the information shall be included in the section.

Sungsoo Kim added self balancing differential for turn-to-turn fault protection to the section. Dale added a sentence to indicate that saturation during internal faults is possible.

Spirited discussion occurred on the subject of adding mention of applying a 21 element with no intentional time delay for redundant protection of the zone between the unit terminals and the GSU transformer. This section of bus is often only protected by the overall unit differential relay. The distance element is applied for protection in the event that the unit differential is out of service. Application of an element on the unit neutral CTs looking forward versus an element on the high-side looking into the unit was discussed. The former is typically available in multifunction relays and requires a much smaller reach than the latter system. In either case, operation on power swings needs to be evaluated even though this can be less of a problem with the former approach. Dale and Sungsoo will determine if a paragraph should be included.

This chapter is nearly ready for peer review. S. Thakur and M. Sachdev will be the peer reviewers for this chapter.

- Section 2.2: Stator Ground Fault Protection – M. Nagpal will perform the peer review of this section and send to authors. If the review process can be completed this month, it will be sent to the TDS.
- Section 2.3: Field Fault Protection – J. Gers is reviewing the section at this time.
- Section 2.4: System Backup protection – C. Mozina and Q. Versosa have combined drafts 1 and 2 to create draft 3. A writeup on the distance function has been added to the section from C37.102. This also includes recommendations on how to set the function. C. Mozina noted that the distance function calculations are performed on a per unit basis.

- Information was also added regarding using the Zone 1 distance function as redundant protection for the iso-phase bus but, it was suggested that this material belongs in section 2.1.

Russ Patterson will perform a peer review on this section.

- Section 2.5: Gen. Breaker Failure – Nothing reported.
- Section 3.1: Abnormal Frequency Protection – J. Johnson will perform a peer review of this section. He will complete his review in by November 1. M. Thompson requested that Jerry send his comments to G. Benmouyal and S. Conrad (section original authors) for them to incorporate his comments. This section should then be ready for TDS review prior to the next meeting.
- Section 3.2: Overexcitation and Overvoltage Protection – The draft will be completed by November and ready for peer review at that time. C. Mozina recommended the IEC V/Hz recommendations and graphs be included in this section. E. Fennell will perform a peer review of this section.
- Section 3.3: Underexcitation/Loss of Excitation – M. Thompson will complete the modifications of Murty Yalla's draft. M. Sachdev will perform a peer review of this section.
- Section 3.4: Current Unbalance Protection – S. Thakur has reviewed the section. K. Stephan and M. Yalla have looked at the comments. K. Stephan updated the short time and continuous tables. It was noted that the short time rating is good up to 120 Sec.

J. Gardell indicated that old machines (before 2005) shall use the old standard and new machines (after 2005) shall use the new standard. There is no reference to support this information.

This section is ready for TDS review.

- Section 3.5: Loss of Prime Mover – Nothing reported.
- Section 3.6: Out-of-Step Protection – Nothing reported.
- Section 3.7: Voltage Transformer Signal Loss – Nothing reported. A peer reviewer will be selected for this section at the next meeting.
- Section 4.1: Inadvertent Energizing – Nothing reported.
- Section 4.2: Special Operating Modes – The authors of this section have requested that the working group consider expanding the scope of this section. Since neither author was present and we ran out of time, this discussion was tabled until next meeting. M. Riechard volunteered to peer review this section when it is ready.
- Section 5.1: Tripping Modes – S. Kim and K. Stephan reported that this section will be ready for review by next meeting. It was noted that tripping modes have been added to many sections within the tutorial. Therefore, it is recommended that this section be reviewed to ensure that it matches the rest of the tutorial.

- Unit Auxiliary Transformers have been added to the tripping modes table.

It was noted that nomenclature within the report needs to be standardized as such: G means generator, N means Neutral. S. Kim and K. Stephan have updated the drawings and tables in this section to conform but all other sections should be reviewed for this as well.

The 67N for multiple high impedance grounded machines connected to the same bus is not currently included in the tutorial. It was added to C37.102. The chair asked the authors of chapter 2.2 to determine if this should be added.

A tripping mode table for hydro units was made by S. Kim. It will be incorporated into the latest draft.

A peer review for this section will be assigned at the next meeting.

- Section 5.2: Multifunction Generator Protection Systems – Nothing reported.
- Section 5.3: Small generator applications – After the meeting, E. Fennell suggested that a short chapter be added to summarize the PSRC paper on the subject. This will be discussed with the WG at the next meeting.

J9: Motor Bus Transfer

Chair: Jon Gardell

Vice Chair: Dale Fredrickson

Established: 2006

Output: Transactions paper or report

Expected Completion: TBD

Status: Draft 0

1. The Working Group met in a double session with 14 Members and 7 Guests on Wednesday, September 10, 2008. This was the eighth meeting.
2. A call was made to approve the minutes of the May meeting by the chair and the minutes were approved.
3. Jon Gardell gave a status report of the work performed to date. The first session was used to review draft 0 and assign individuals to the various sections to develop them further. Most sections were assigned with the exception of those that require results from the testing or other further work and investigation.
4. The second session's focus was to discuss the planned field testing and data acquisition at the TVA Paradise Plant. A Sub-team was formed of Russ Patterson, Mike Thompson, and Tom Beckwith to focus on putting in place equipment at the Plant by January 2009. This team will work with TVA and Beckwith Electric resources to work towards placing measurement and data recording systems on-site to capture any transfer events that occur. The main reason for this approach is that the TVA transformer project work that was originally going to be used to facilitate the staged testing has been delayed until 2011.
5. Several other members are going to investigate the possibility of other locations and plants to put in place recording equipment to capture bus transfer data. Both generation and industrial facilities will be considered. Any prospects will be reported back to the Working Group.
6. A number of assignments were made that are due by December 15, 2008 to the Chairman.

J10: Guide for AC Motor Protection

Chair: Prem Kumar

Vice Chair: Dale Finney

Established: 2007

Output: Guide Revision

Expected Completion:

Status: Draft 0.2

The meeting was attended with 7 members and 9 guests. After the introductions, the Patent Slides were shown.

The Kansas City meeting minutes that were circulated were approved with quorum.

Various Peer review assignments were reviewed. Following are the follow-up assignments based on meeting. All remaining assignments/peer review are due by December 15th. The various item number topics are shown.

- 1) Sudhir Thakur would add data so as to cross reference various types of faults with applicable protective functions that would detect them (Item 1, motor failure mechanisms). He would expand on Item 3 (motor speed torque curves)
- 2) Prem Kumar would re-review Item 2 (motor thermal constant discussions) to make it overall more general and not specific to any manufacturer. Prem Kumar would rereview item 12 (application of low-ratio CTs, high-ratio retrofit).
- 3) Dale Finney would summarize J1 report (ASD) to about 4 pages so that it could be included in guide Dale Finney would use larger motor nameplate for item 2 (motor data sheet interpretation).
- 4) Suhag Patel would review items 14 and 15 (MG1 reference documents on insulation class) and summarize relevant information that could be included in guide.
- 5) Summary of Item 9 (J10 Working Group on Motor-Bus transfer) that would need to be included in guide would be assigned later.
- 6) Items 5 (fuse coordination) and 7 (power factor correction capacitors) and 10 (torroidal CT concerns) would be peer reviewed by Chris Ruckman (carry over from last meeting assignment).
- 7) Tom Farr would submit item 6 (reduced voltage starting). He is to peer review Item 10 (torroidal CT concerns) (carry over from last meeting assignment).

JTF3: NERC Generator Protection Response (Generator Backup Relay Application and Verification)

Chair: Joe Uchiyama

Vice Chair:

Established: 2007

Output: Special Report

Expected Completion: TBD

Status: Outline

The SPCTF met in Toronto in August 2008 and they have changed the direction of this paper to "Generator Relaying Application and Coordination between Generation and Transmission Protection Systems" from "Generator Backup Relays Review." There are well-established guides for both transmission and generator protections; however, there is not any paper to discuss coordination issues between System and Power plant protection. As many of you are aware of the NERC requirements of PRC-001, every utility has been in the process of certification (evidence of coordination). This new paper will basically be support for the process of PRC-001. This paper includes:

(1) How/What/Which to coordinate relaying between system and generator protection.

(2) What information exchange (relay data exchanges) is needed for the coordination between generator owners and transmission system owners, and

Hopefully SPCTF will have a draft document for review by JTF3 and J subcommittee at the PSRC portion of the January 2009 PES Technical Committee meeting.

Liaison Reports

Electric Machinery Committee

C.J. Mozina

The Committee met at PES General Meeting in Pittsburgh, July 21-25. The agenda for this meeting is on the EMC website but the minutes have not yet been posted. This committee is divided into three subcommittees: Generation, Motors and Materials. Of interest to the PSRC is a recent establishment of a new WG on generator-grid interaction. This WG is to investigate generator shaft torque stresses due to transmission system events such as: faults on circuits that are two or more levels removed from the generator, high speed reclosing, series capacitor switching (bypass and automatic reinsertion), and single pole tripping. It will also investigate the necessary generator monitoring to capture the shaft torque stresses. The PSRC should consider establishing liaison with this WG. The chairman is Tom Wait (trw104@sbcglobal.net).

AS I&CPS Committee

C.J. Mozina

his 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

No report

NERC

J. Uchiyama

Joe Uchiyama did not attend the meeting and Tom Wiedman will give the report at the main committee and it will be included in the main committee minutes.

Coordination Reports

None

Old Business

J5 working group paper was presented by Chuck Mozina at I&CPS. It will be presented again at the Nuclear Relay Conference (Sept 2008) by Murty Yalla in San Diego.

New Business

There was a request from Phil Waudby to start a working group for a "Tutorial on What a generating facility has to do to meet NERC requirements". The subcommittee discussed this and decided to postpone forming a working group until a stable NERC draft document is available.

K: SUBSTATION PROTECTION SUBCOMMITTEE

Chair: F. P. Plumptre

Vice Chair: P.G. Mysore

The K-Subcommittee met on Wednesday September 10, 2008 in Burnaby, BC, Canada, with 13 members and 20 guests in attendance. The minutes of the May 2008 meeting in Kansas City, MO was approved.

ITEMS OF INTEREST FROM THE ADVISORY COMMITTEE MEETING:

To plan presentations at the future meetings, the chair requested information from the working groups who are completing or have just completed their work.

Members were also invited to participate in the preparation of tutorials presented at PES meetings.

WG chairs should make sure that the presentations at these meetings are technical and not commercial. Materials presented needs to be reviewed for commercial content before the presentation.

Working groups working on IEEE standards or guides need to make sure that they have the "Quorum" required by the IEEE standards. The Quorum is at least 50% of the membership present at the meeting.

Reports from the WG Chairs

K1: Protection of Transformers against faults and abnormal conditions

Chair: Mohindar Sachdev

Vice-Chair: Pratap Mysore

Established: 2003

Output: Revision of IEEE C37.91-2000

Expected Completion Date: 2007

Guide: Balloted and Approved , Summary Paper expected to be completed by 2009

The Working Group K01, Protection of Transformers Against Faults and Abnormal Conditions, did not meet during the PSRC meetings in Vancouver.

The approved draft of the IEEE C37.91 guide was being reviewed by the SA editors at the time of the May meeting of the WG. The review was completed and the guide was published in June 2008 as planned. A paper describing the revised draft is being prepared and will be distributed among the WG members before the January 2009 meeting of the PSRC.

KTF2: Revision of C37.108-2002 Guide for the protection of Network Transformers

Chair: Charlie Sufana

The task force KTF2 Revision of C37.108 Network Transformer Protection Guide met on September 9, 2008 with 5 members and 3 guests attending. This was the second meeting of the task force.

Chairman Charles Sufana went over the results of the re-affirmation ballot. The guide was reaffirmed in December 2007. However, there were several negative ballots that needed to be reviewed.

The task force chair went through each of the negative vote comments. After some additional discussion concerning the ongoing work in P1547.6, it was decided to not pursue any work on C37.108 at this time. The task force did feel that it should wait to see the results of P1547.6 and will take up any revision at a later date. The next revisit to the guide will probably be in 2010. Thus it was decided that the task force disband until a later date.

K3: Reducing Outages Through Improved Protection And Auto restoration In Distribution Substations

Chair: Bruce Pickett

Vice Chair: Tarlochan Sidhu

Established, 2002

Output: Paper

Expected Completion date: September 2008

Draft 11

At the request of Bruce Pickett, Frank Plumtre chaired this meeting with 5 members and 2 guests.

Item 1 – Finalize revisions to Figure 5 plus supporting text (Frank Plumtre, Patrick Carroll)

This was discussed and minor changes were made and agreed to in a file called 'Revised Figure 5_Sep_2008.doc' which was sent to the chair of the WG group.

Item 2 – Finalize

Agree on changes proposed by Paul Elkin to move section 4.3 material into section 6.2, including Figure #7. This is to avoid duplication. Paul Elkin's proposal was reviewed by the WG group and agreed to with minor changes. Refer to file called 'WG K3_draft11a - Elkin Comments_Sep_2008.doc'

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

Chair: Mukesh Nagpal

Vice Chair: TBA

Established, xxx

Output: Consider revision to guide

Expected Completion Date: 2012

The Working Group had its first meeting with 10 members and 5 guests on Tuesday, September 9, 2008, in a single session.

- After introductions, the scope of the guide was discussed. It was clarified that this guide is intended for customers connected to transmission or sub-transmission system.
- Chair also discussed timeline of the working group. Chair will apply for PAR in January 2009, which will allow WG to complete its assignment by December 2012 in-time before the present guide expires. The present guide was reaffirmed in 2007.
- Some of members discussed their own utility's experience with large customer motors back feeding into transmission system and causing over-voltage concerns.
- There was also discussion about guide lacking on interconnection requirements for customers with in-plant generation.
- The work group is looking for a volunteer to lead as Vice Chair. Sub-committee Chair is requested to announce about the group at the main committee meeting to seek for volunteers for Vice Chair or others who may also want to make presentations at this group.

The working group will meet in double session in January 2009. There will four presentations by Mukesh Nagpal, Simon Chano, Randy Crellin and Frank Plumptre.

K5: APPLICATION OF COMMON PROTECTIVE FUNCTIONS IN MULTI-FUNCTION RELAYS

Chair: Simon Chano

Vice Chair: Dean Miller

Established, 2005

Output: Report to the PSRC

Expected completion date: Early 2009

Draft 4

Working Group K5 met in a single session on Tuesday, September 9, 2008 in Vancouver, BC with 13 members and 15 guests.

The changes to the report that were included in draft 6 were discussed. As a result of the discussion the following actions are to take place:

1. Clause 2.1 "Protection Concepts" will be revised
2. Bullet item 7 in clause 2.1 will be moved to clause 2.3 "Functional Monitoring".
3. Clause 4 "Automatic Reclosing" will be revised to deal with the editorial comments in this section in draft 6.
4. A summary clause will be written.
5. Annex 5 will be revised to better fit the role of an annex.

All of the writing assignments are due by November 15.

It was agreed that the figures in the report would be left in the variety of different drawing styles.

A draft 7 of the report will be emailed to the Working Group members for their review by December 1.

A team of five Working Group members has agreed to write a summary paper based on the content of the report.

K6: Sudden Pressure Protection for Transformers

Chair: Randy Crellin

Vice Chair: Bill Gordon

Established: May 2005

Output: Report

Expected Completion Date: May 2009

Draft 2.0

The working group met on Wednesday morning, September 10th, in a single session with five members and three guests. The working group currently has 20 members.

After introductions and approval of the previous meeting minutes, the working group discussed the current status of the interactive web based survey. After several months of effort, we were unable to develop a “bug free” interactive web survey. There were several data problems that could not be solved when multiple people took the survey at the same time. After further discussions, it was decided to proceed with a standard non interactive survey. Gene Henneberg volunteered to rewrite the survey question document for uploading on the PSRC K6 web page.

As previously identified, we have obtained the attendance and/or membership lists of the following individuals which we intend to email survey request notices (utilities only):

- 2007 WPRC
- 2008 WPRC (pending)
- 2007 MIPSYCON
- 2008 Texas A&M
- 2008 Georgia Tech
- WECC Members
- PSRC Main Committee
- Power System Protection Yahoo Users Group

Our current plans are to send a copy of the web survey questions to the PSRC officers for comments and approval the first of November. Then send the survey request notices to the recipients with the survey period closing the end of December, organize the survey responses the first week of January, and then meet to discuss during the January 14th meeting in Atlanta.

K7: GUIDE FOR THE PROTECTION OF SHUNT REACTORS.

Chair: Kevin Stephan

Vice Chair: Pratap Mysore

Established, 1999

Output: Revision of ANSI/IEEE C37.109

Expected Completion date: 2006

Status: Published

Working Group K7 did not meet at this meeting. The Paper has been circulated to subcommittee members for approval.

At the subcommittee meeting, the chair mentioned that due to copyright issues, the paper will not be published on IEEE PSRC website.

K8: GUIDE FOR THE PROTECTION OF SHUNT CAPACITORS

Chair: Pratap Mysore

Vice Chair: Arvind Chaudhary

Established, 2006

Output: Revision of IEEE C37.99

Expected Completion date: 2011

Status: Draft 1

K-8 met on September 10, 2008 in one session with a total of fifteen attendees, twelve members and three guests. Oscar Bolado and Bill Strang joined the working group as members.

May 2008 Meeting minutes were reviewed and approved. Since the working group membership is now up to 26, the chair will e-mail the minutes to get approval to meet the “quorum” requirements. The patent slides from IEEE were shown to the working group to comply with the IEEE policy.

The working group reviewed the submittals on unbalance relaying methods by Ilia Voloh, on Capacitor bank considerations by Jim O’Brien and on commissioning clause by Greg Sessler.

Clause 8- Unbalance relaying methods: John Appleyard discussed his comments:

-8.2.6.1 question related to figure 12(a) and the discussion in paragraph associated with this figure. He was trying to understand the statement on the unbalance voltage as three times the value obtained in the method shown in 12(b). Charlie Sufana agreed to review this section to provide an explanation.

Clause 10 – Bank consideration – Jim O’Brien briefly explained the changes.

Comments were added to address concerns of higher TRV and subsequent failure of the breaker clearing faults between the reactor and the capacitor banks. Chair mentioned that the discussions with one of the manufacturers suggested that capacitor bank application is to be considered as non-standard application as far as the fast transients are concerned. The Fast TRV rating is tested only at 30% of the rating and the capacitor fault current could be higher than this value.

Clause 12 – Commissioning – Greg Sessler explained that a new paragraph is added for the capacitor bank operation.

Paul Elkin’s submission of review of clause 4 titled ‘Basic consideration’, will be included in the next draft.

Annex C and D was updated by Bill Gordon.

Russ Patterson gave a presentation on “ Bridge Capacitor Banks” . He will be submitting a write up to be added in the Bank configuration section of the guide.

Demetrios indicated that he would review Clause 8 and send in his comments.

Other items:

Pratap Mysore and Arvind Chaudhary went through the negative ballot comments – Most of them are addressed except for comments on the use of current limiting reactors.

Pratap met with John Harder before the September meeting to review the negative comments and also to get his suggestions on the revision of the guide. Here are few points:

Unfused banks: . John felt that the discussions on the unfused banks need to stay in the guide as there are many installations in service though this is not supplied by the manufacturer. Negative ballot comments were reviewed. The suggested changes will be incorporated in the next draft.

K9: Protection Considerations to Mitigate Arc Flash Hazards

Chair: Karl Zimmerman

Vice Chair: Roger Hedding

Established: 2005

Output: Technical report to Substation Protection Subcommittee

Expected Completion Date: December 2008

Draft 5

The working group met on September 9, 2008 with 5 members and 9 guests. Draft 7.0 was distributed to the attendees.

The only change of substance was to the Appendix. Thanks to some input from Brian Boysen of WE Energies, and a few other utility engineers who are working on the arc-flash issue, we decided to give simple examples, and remove the detailed calculations, as many of the reference documents (NESC C2-2007, IEEE 1584) are in a state of change.

We received several e-mail approvals from WG members who could not attend.

Otherwise, the paper is done. Only a few formatting changes are required, and some minor revisions. The paper is a good read, only 7 pages, and very nicely summarizes arc-flash issues, with respect to the Power System Relaying Committee.

The paper will be submitted to the Subcommittee members and PSRC officers via the K website by October 15, 2008. Written comments are due to the Chair by November 15.

The WG will meet in January 2009 to discuss where the paper might be presented and any other activities.

K10: SCC21 DISTRIBUTED RESOURCES STANDARD COORDINATION

Chair: Gerald Johnson

Vice Chair: TBA

Established, 1999

Output: Standard through the SCC 21

Expected Completion Date: 200x

K10--SCC21 Distributed Resources Standard Coordination working group met Sept 9, 2008 with 6-members and 1-guest. IEEE 1547 working groups met the first week August in Portland, OR. I updated the group on recent SCC21 activities including the reaffirmation of 1547-2003 and the first ballot of P1547.2. 1547-2003 received a 92% affirmative with a ballot pool of 181 members and is on its way to the standards board. P1547.2, Application Guide received an 87% affirmative vote with a 210 member ballot pool. There were many comments which are in the process of being resolved.

We discussed activities associated with P1547.4 "Draft Guide for Design, Operation and Integration of Distributed Resource Island Systems with Electric Power Systems" and P1547.6 Recommended Practice for Interconnecting Distributed Resources With Electric Power System Distribution Secondary Networks".

P1547.4 is now at Draft 5 and is available on the SCC21 web site with a password which I can supply on request. This working group expects to go to ballot in early '09. P1547.6 moved to draft 2.0 and is also available on the SCC21 web site. This working group still has quite a bit of work before it will be ready for ballot.

The 1547 meeting was sponsored by Portland General Electric. PGE has a very active program for recruiting standby generator owners in an effort to build a "virtual peaking" network. Mark Osborn of PGE presented a slide show to the 1547 working group on the subject and we were invited to see a demonstration at their DG control center. The network is tested every month and PGE allowed us to observe the August test which involved start and auto sync of 43 megawatts of DG. These units can be brought on line very quickly, and qualify as spinning reserve. Their goal is to reach a total of 150 megawatts. Mark provided a copy of his slide show which I presented at our K10 meeting.

If you have special interest in the progress of a particular working group or would like to provide input, let Gerry Johnson know and he will supply the appropriate password to get to the latest draft or make sure that the information gets to the right place.

K13: (PC 37.116): GUIDE FOR PROTECTIVE RELAY APPLICATION OF TRANSMISSION-LINE SERIES CAPACITOR BANKS.

Chair: Frank Plumptre

Vice Chair: Dan Hamai

Established, 1999

Output: With the completion of the Guide the current project is a transaction paper

Expected Completion Date: Summary Paper by mid 2008

The working group did not meet in Burnaby. Work is continuing on a summary paper.

K14: (PC 37.234): GUIDE FOR PROTECTIVE RELAY APPLICATION TO POWER SYSTEM BUSES

Chair: Bogdan Kasztenny

Vice Chair: Stephen Conrad

Established: May 2005

Output: Guide (PC37.234)

Expected Completion Date: 2008

Draft 7.01

The K14 Working Group met on September 10, 2008, in Burnaby, BC, with 9 members and 12 guests in single session. Chairman Bogdan Kasztenny presided. The minutes of the May 2008 meeting could not be approved due to a lack of a quorum. The chairman will solicit approval via email. The chairman also noted that in order to conduct WG business the entire membership will be reassessed and those who are not actively supporting the work activities will be asked to resign. This will help to establish a quorum in the future.

The Chairman discussed the IEEE patent requirements and reviewed the status of the guide to date. The current draft is D7.01

Annex C material for inclusion was presented by the chairman. This discussed the logic associated with the example of Double-Bus-Single-Breaker. The logic equations were presented to provide for protection of the various bus zones and how to implement the logic based on the switching configurations.

The configuration of a "MAIN and TRANSFER bus configuration will also be included in the Annex C material.

The chairman requests the members to read the entire document as we will be closing the insertion of new material in preparation for ballot of the document. As such send any new material to the chairman prior to December 1, 2008. The PAR is set to expire in 2009.

Liaison Reports:

Nothing to report

Old Business:

Nothing to report

New Business:

An exploratory meeting with Capacitor subcommittee is suggested to investigate opportunities for better coordination between PSRC and the capacitor subcommittee. Simon Chano agreed to convene this.

Mohammed Ibrahim, Dominique Fontana, Paul Elkin, Greg Sessler and Rich Young are the new members of the subcommittee.

VII PRESENTATIONS:

Our main committee meeting is greatly enhanced by presentation by our members of the outputs of the different working groups. We always appreciate their efforts. This time we had two interesting presentations.

- Microprocessor Based Equipment Firmware Control Bob Beresh
- Revision of C37.2, Standard Device function Numbers,
Acronyms, and contact Designations John Tengdin

Future Meetings:

September 7-11, 2008 Burnaby, B. C., Canada
January, 2009 Joint PES Meeting, Atlanta, GA

May 10-14, 2009 –

Pittsburgh, PA

VIII. The meeting was adjourned by Chairman Charlie Henville.