



POWER SYSTEM RELAYING COMMITTEE

OF THE

IEEE POWER ENGINEERING SOCIETY

MINUTES OF THE MEETING

January 7-10th, 2008

San Antonio, TX

FINAL/APPROVED

**Power System Relaying Committee
Main Committee Meeting Agenda
January 10, 2008
San Antonio, TX
8:00 AM – 11:30 AM**

- | | |
|--|-------------------------|
| I. Call to order / Introductions | 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 | John McDonald |
| C. CIGRE Report | T. W. Cease |
| D. UCA Report | John Burger |
| E. EPRI Report | Joe 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 | Mike McDonald |
| V. Subcommittee Reports | Charlie Henville |
| C- System Protection | Rich Hunt |
| I - Relaying Practices | Tarlochan Sidhu |
| K - Substation Protection | Frank Plumtre |
| H - Relaying Communications | Alex Apostolof |
| D - Line Protection | Mike McDonald |
| J - Rotating Machinery | Wayne Hartman |
| VI. Presentations | Bob Pettigrew |
| • Guide for the Application of Rogowski Coils | Ljubomir Kojovic |
| • Cybersecurity Issues for Relaying | Solveig Ward |
| • Revision of C37.90, Standard for Relays and Relay Systems | Mario Ranieri |
| • IAS Color Book ReEngineering Project | Cary Cook |
| 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 (September Meeting) & Financial Report Pettigrew

The minutes of the Charlotte (September, 2007) meeting were approved.

The joint meeting had two meeting sponsors, ABB and AMETEK. We appreciate their support for this PSRC meeting. A brief financial summary was given. The changes in registration cost and the elimination of the cash bar have resulted in a profit for the Charlotte meeting. The PSRC is not involved financially with the joint PES meeting so we will see neither profit or loss.

III Chairman's Report Henville

This Main Committee meeting concludes what has been our first participation (at least in recent times) in a PES organized joint technical committee meeting. The PES and the PSRC officers are keenly interested in receiving your written feedback as to how the joint meeting could be improved. In addition to a two different surveys issued by PES, specific suggestions for improvements are also hereby solicited.

In this meeting several discussions for cooperative work were held, and these discussions will continue and hopefully, will lead to increased joint activities with other technical committees.

As a reminder, please note the requirement to be a member of IEEE Standards Association in order to ballot any standard document. Everyone who participates in development of a standard document has the opportunity to influence its content. However only those who are members of the standards association will be invited and eligible to ballot the document and to have their opinion formally noted.

Congratulations to new fellows Ken Martin, Bogdan Kaztenny and Vahid Madani. They continue to uphold the PSRC tradition of producing a disproportionately high number of fellow grade members.

Congratulations also to the new honorary members of the PSRC, Bob Beckwith, Paul Drum, Bill Lowe, and Stanley Zocholl. The PSRC is grateful for their extensive and significant contributions to the Committee work.

Welcome new Main Committee members Tom Beckwith, Marc Benou, Christoph Brunner, Dale Finney, Dale Fredrickson, Fred Friend, Jerry Jodice, Jim O'Brien, Bruce Picket, Mike Reichard, and Mark Schroeder

Reports of Interest

A. Technical Paper Coordinator's Report – Sept. 2007 Sanders

The IEEE PES 2008 T&D Exposition in Chicago is scheduled for Chicago in April. We received 19 papers and 1 Transaction Paper. The poster session has been scheduled for Tuesday afternoon during the conference. Please stop by and say hello to the authors.

The call for papers for the IEEE PES 2008 General Meeting in Pittsburgh now closed. We received 55 papers and 5 transaction papers for review. Review process is still going on and expect to have it complete by the end of the month, to allow revise and resubmittals to the authors. Everyone responded to my requests for reviewers with a resounding reply! I greatly appreciate it.

Future Meetings

NOTE for September 2008 meeting. New passport requirements are in place now. Be sure you have an up-to-date passport. For those of you who have passports – be sure they are not expired!

January 2009 – will be joint with the other PES Technical Committees. Time and place to be determined, but looking at the Southeast.

May 2009 – Pittsburgh, PA May 10-14th at the Doubletree on Bigelow Square.

B PES Report

John McDonald

No Report submitted.

C. CIGRE B5 Activities Report

Cease

The 2007 Colloquium was held in Madrid Spain October 15-20, 2007.

The US had 6 papers in the colloquium. The papers were listed in previous reports.

At the Colloquium 4 new working groups were started. They are:

WG B5.38 The Impact of Implementing Security Requirements using IEC 61850,
WG B5.06 Maintenance Strategies for Digital SAS Systems,
WG B5.12 Engineering Guidelines for IEC 61850 Based Digital SAS, and
WG B5.14 Wide Area Protection & Control Technologies.

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

The 2008 session will be held in Paris August 24-29, 2008. The US has an allotment of 10 papers for all 16-study committees. Attached is a listing of the 10 papers accepted by CIGRE. In an effort to have more US papers included in the session several papers were recommended for the International category, in which the authors are from more than one country. Attached is a list of 8 papers that were accepted in that category. Don Russell created a category this year called Alternative Papers. He submitted 4 papers in that category and 3 were accepted. They are also included in the attached list.

The preferential subjects for the Paris session are:

PS1: Impact of Process-Bus (IEC61850-9-2) on Protection and Substation Automation Systems

- System reliability
- System architecture
- Experiences so far

PS2: Life Cycle Management of Protection and Control Systems

- System testing policies
- Testing of Protection and Substation Automation Systems
- Procedures, tools and experiences in Life Cycle Management
- Experiences/systems for remote maintenance

Study Committee B5 has a number of open working groups as shown in the attached file. There are a number of these working groups that will close this year and new working groups will be formed at the Paris session. Anyone wishing to be come involved in CIGRE work is invited to participate in these working groups as they are formed.

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USNC Quota

1. J. L. Kirtley, Jr. – “Improving Efficiency of Induction Motors Using Die-cast Copper Squirrel Cages”
2. G. Gauger, G. Lemm, A. Martins, M. Rapp – “Mineral Oil with Corrosive Sulfur – Method Evaluation to Identify False Negatives and Its Performance with blends of Natural Ester”
3. P. Reichmeider, S. E. Jacobson, C. W. Devine, D. N. O’Connell, J. R. Wilson, J. R. Colson – “Experience with New Methods for Live-Line Conductor Replacement”

4. K. Kutlev, L. Tang, R. M. Reymers – “Complete Methodology for Selecting Optimal Substation Solutions”
5. M. Adamiak, B. Kasztenny, J. Mazzereuw, D. McGinn, S. Hodder – “Considerations for Process Bus Deployment in Real-World Protection and Control Systems: A Business Analysis”
6. S. Venkataraman, H. Elahi, E. Larsen, K. Schreder – “The Linden Variable Frequency Transformer Merchant Transmission Project”
7. K. Moslehi, R. Kumar, A. Bose, C. Gelling – “Smart Infrastructure for a Self-Healing Power Grid — Concepts for Coordinated Intelligent Control”
8. J. C. Smith, M. Ahlstrom, R. M. Zavadil, B. Oakleaf, T. Godart – “The Role of Wind Forecasting in Utility System Operation”
9. L. Ott – “Implementation of Demand Response in the PJM Synchronized Reserve Market”
10. S. Chuang, C. W. Gellings – “Demand-side Integration in a Restructured Electric Power Industry”

International Quota papers

1. D. Lindsay, M. Roden, D. Willen, A. Keri, B. Mehraban – “Operating Experience of 13.2 kV Superconducting Cable System at AEP Bixby Station”
2. L. O. Barthold, D. E. Douglass, D. A. Woodford – “Maximizing the Capability of Existing EHV Transmission Lines “
3. J. Phillips, C. Engelbrecht – “The feasibility of using daytime corona inspection to identify contaminated insulators that needs to be washed”
4. R. Adapa, S. Maruvada, M. Rashwan, N. Hingorani, M. Szchetman, R. Nayak – “R&D Needs for UHVDC at 800 kV and Above”
5. Apostolov, B. Bastigkeit – “Testing of Modern Bus Protection Systems”
6. Apostolov, B. Vandiver, D. Tholomier – “Testing of Distance Protection Relays”
7. O. Huet, J. Ph. Tavella, T. Coste, J. Hughes – “Reaching out Seamless and Cost-effective Automation beyond IEC 61850”
8. X. Wang, H. Hamadani, K. Morison, A. Moshref, A. Edris, C. Bridenbaugh – “Systematic Approach for Identification of Voltage Collapse Areas and the Reactive Power Reserve Requirements in Large Interconnected Transmission Grids”

USNC Quota alternative papers submitted

1. M. Begovic, N. Hampton, R. Hartlein, J. Perkel – “Validation of the accuracy of practical diagnostic tests for power equipment”
2. T. Witham – “Secure Substation Networks: Implement for Today; Design for Tomorrow”
3. L. Kojovic – “Innovative Non-conventional Current Transformers for Advanced Substation Designs and Improved Power System Performance”

D. UCAIug Report

Burger

No Report

E. EPRI Report

Hughes

No Report.

F. IAS Power System Protection Committee

Mozina

The following are items of interest to the PSRC that occurred at these meeting:

- **Color Book Reorganization** – The color books are to be combined to reduce their number and a common or “Base Book” 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 book. One of the goals 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. At the Annual IAS meeting chairpersons were selected for each chapter. These chairpersons are to then form

WGs to update the chapters. Carry Cook who chairs this effort within the IAS presented an overview of the effort during his presentation at the Main Committee meeting.

- **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. This is required to reduce the ground current for internal generator stator ground faults. The generator is grounded during this period with a high resistance source. Surge protection has also been defined by the WG. The WG will report on its findings in a paper to be presented at the May 2008 IAS I&CPS conference to be held in Clearwater, FL.
- **Arc Flash** – Arc flash study guidelines are addressed by WG 1584 within the Petro-Chemical Committee of the IAS. This WG is currently updating the “ Guide for the Performing Arc Flash Hazard Calculations” This effort relates directly to the efforts of our WG K-9.
- **Electric Safety Workshop** – This annual conference will be held in Dallas, TX on March 18-21,2008. Subject such as arc flash hazard mitigation and the role of protection system in reducing arc flash hazards are some of the subject discussed at the workshop. Many consulting engineers attend who are involved in conducting arc flash studies to get updated on the latest method. WG 1584 also meets at this conference.

G. IEC Report

Udren

TC 95, Measuring Relays

The USNC Technical Advisory Group (WG I4) is reviewing three working drafts for TC 95 protective relay electrical environment and design standards, with votes due in May:

Committee Draft for Voting (CDV) for 60255-22-3 for Electrostatic Discharge Immunity Test – as with RF immunity tests, IEC has less demanding compliance levels than IEEE C37.90.3. IEC categorizes relays as requiring an 8 kV test, while IEEE calls for a 15 kV discharge that properly simulates low humidity environments. The IEC test is thus not a challenge for manufacturers testing to IEEE levels, and may not be adequate for some North American environments.

CDV for 60255-22-5 for Surge Immunity Test – a high energy surge test of up to 2 kV with 1.2 microsecond rise time, 50 microsecond fall time, and low source impedance. This simulates lightning surges, not fast transients or oscillatory surges simulated in other IEC and IEEE SWC test standards.

CDV for 60255-11, Interruptions to and alternating component (ripple) in ac and dc auxiliary energizing input of measuring relays and protection equipment – 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.

At this San Antonio meeting, we were lucky to have Dr. Norbert Rochow, who is Convenor for the IEC WG revising these standards. He was able to explain the changes as well as hear the North American perspective. This helps us gain mutual understanding when the IEC WG does not have North American participation. Our lack of industry support to send participants is a problem I bring up frequently in these reports. IEC functional standards are the one area where we are having successful exchange do the role of Murty Yalla as Convenor for IEC TC 95 maintenance team 3 working on these. The Technical Advisory Group reviewed:

Draft 60255-151 - Functional standard for over/under current protection. This is a new standard from TC 95 Maintenance Team 3 chaired by Dr. Murty Yalla. The new draft Standard absorbs, updates, and supersedes IEC 60255-3 and IEEE C37.112-1996. The first CD was reviewed by national committees,

and the standard needs constants for reset timing of what used to be called IEC relay curves. This should be complete in 2008.

Draft 60255-127 - Functional standard for over/under voltage protection. This work by TC 95 MT4 is not yet ready for draft circulation, and is adding some application basis for inverse time curve shapes of voltage relays

Draft 60255-121 Functional standard for distance relays – draft still under development.

TC 57, Teleprotection and Power System Control

Christoph Brunner who chairs TC 57 WG10 developing 61850, reports WG 10, 17, 18 work on the following topics:

(1) There are two working groups (WG17, WG18), that adopt IEC 61850 for applications other than substations. These working groups prepare the following documents:

- IEC 61850-7-510: use of the logical nodes defined in IEC 61850-7-410 to model applications for the control of hydro power plants
- IEC 61850-7-420: object models for distributed energy resources – this is planned to be circulated as FDIS in the middle of this year

(2) Working group 10 prepares Edition 2 of IEC 61850. Edition 2 will incorporate many clarifications as well as new features used by other domains. Although included will be models for power quality. It is expected, to have a CDV of Edition 2 circulated in the first quarter of this year. A new part IEC 61850-7-500 will be prepared that explains the use of logical nodes defined in IEC 61850-7-4 to model applications of a substation automation system.

(3) A task force of WG 10 is addressing the use of IEC 61850 for communication between substations. One typical application is the communication used between two distance protection relays to implement the different teleprotection schemes. A draft report for comment will be circulated as IEC 61850-90-1 this month. Within the report, topics addressed are the communication architecture, the IEC 61850 modeling of the teleprotection equipment and the impact on the configuration using IEC 61850-6 system configuration language.

(4) Another task force of WG10 is addressing the mapping of IEC 61850 on IEC 60870-5-101 /-104 as it is used in a gateway between a substation using IEC 61850 and the communication towards a control center using 60870-5-101 /-104. A draft technical specification is currently being circulated.

In addition, a task force of WG19 is addressing the issue of using IEC 61850 for communication between substation and other field devices to control centers. It is planned to circulate a report IEC 61850-90-2 later this year. This must also be harmonized with CIM.

H. Standard Coordinators Report

Gilbert

The Standards Coordinator, Jeffrey Gilbert, met with the Chairs of the Working Groups writing and revising standards documents at a session beginning at 8:00 AM on January 7, 2008, in the Rio Grande West room of the Hyatt Regency San Antonio.

Maira Patterson, Administrator, Governance; IEEE-SA, gave a presentation on REVCOM. Ms. Patterson answered questions from working group and subcommittee chairs.

The status of the PARs is summarized below. The actions to be taken for keeping up-to-date the approval of the PARs and for keeping live the Standards and Guides are identified. A summary of the specific approvals received, since the September, 2007 meeting of the PSRC, are identified as well. 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

All Standards developing groups are required to submit an L50-S form annually. The report for 2007 is due March 2008. There is no need for working group chairs to submit the form. The Standards Coordinator will submit one L50-S on the behalf of all PSRC working groups, indicating that the working groups have no financial activity to report. Do not send reports to the PSRC secretary

Standards Coordination Effort

Every PAR approved by the Standards Board is posted on the SA Web site at the following address.

<http://standards.ieee.org/board/nes/approved.html>

PARs applied for by all Committees of the Power Engineering Society (PES) are listed in the NESCOM meeting minutes. The following PAR has been approved by the IEEE-SA Standards Board may be of interest to PSRC attendees. If you are interested in the development work planned in a PAR, contact the Chair of the Working Group that is developing the document and sign up for participating in the activity of that Working Group.

PC37.43 - Standard Specifications for High-Voltage Expulsion, Current-Limiting and Combination Type Distribution and Power Class External Fuses, with Rated Voltages from 1 kV through 38 kV, Used for the Protection of Shunt Capacitors

The PAR has been extended to December, 2008 for PC57.13 - Standard Requirements for Instrument Transformers

If you are interested in the development work planned in a PAR, contact the Chair of the Working Group that is developing the document and sign up for participating in the activity of that Working Group.

Standards Activities Since The September, 2007 Meeting

The status of the standards activities, which have taken place since the May, 2007, meeting of the PSRC, are as follows.

1. Standards Published

C37.101-2006-Cor 1 Guide for Generator Ground Protection - Corrigendum 1: Annex A.2 Phasor Analysis (Informative)

2. Standards waiting to be Published

- C37.110 IEEE Guide for the Application of Current Transformers Used for Protective Relaying Purposes
- C37.230 Guide for Protective Relay Applications to Distribution Lines
- C37.235 Guide for the Application of Rogowski Coils used for Protective Relaying

3. Standards Reaffirmed

- C37.95 IEEE Guide for Protective Relaying of Utility-Consumer Interconnections
- C37.108 IEEE Guide for the Protection of Network Transformers

4. Standards submitted for reaffirmation

- C37.95 IEEE Guide for Protective Relaying of Utility-Consumer Interconnections
- C37.108 IEEE Guide for the Protection of Network Transformers

5. Standards approved

- C37.101-2006-Cor 1 Guide for Generator Ground Protection - Corrigendum 1: Annex A.2 Phasor Analysis (Informative)
- C37.110 IEEE Guide for the Application of Current Transformers Used for Protective Relaying Purposes
- C37.230 Guide for Protective Relay Applications to Distribution Lines
- C37.235 Guide for the Application of Rogowski Coils used for Protective Relaying

6. Standards submitted for approval

- 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
 - PC37.230 Guide for Protective Relay Applications to Distribution Line
 - PC37.235 Guide for the Application of Rogowski Coils used for Protective Relaying
7. Standards to be submitted for approval
 - None
 8. Submitted for Balloting/ Recirculation
 - C37.94 IEEE Standard for N Times 64 Kilobit Per Second Optical Fiber Interfaces Between Teleprotection and Multiplexer Equipment
 - C37.104 IEEE Guide for Automatic Reclosing of Line Circuit Breakers for AC Distribution and Transmission Lines
 - PC37.230 Guide for Protective Relay Applications to Distribution Lines
 9. Standards Balloted
 - C37.104 IEEE Guide for Automatic Reclosing of Line Circuit Breakers for AC Distribution and Transmission Lines
 - PC37.101-2006-Cor 1 Guide for Generator Ground Protection - Corrigendum 1: Annex A.2 Phasor Analysis (Informative)
 10. Standards Re-circulated
 - PC37.230 Guide for Protective Relay Applications to Distribution Lines
 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
 - C37.106 Guide for Abnormal Frequency Protection for Power Generating Plants
 - 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
 - PC37.90.1 Standard Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus
 - PC37.118 Standard for Synchrophasors for Power Systems
 15. New PARs approved
 - None
 16. PAR Extensions applied for
 - PC37.91 IEEE Guide for Protective Relay Applications to Power Transformers
 - PC37.105 IEEE Standard for Qualifying Class 1E Protective Relays and Auxiliaries for Nuclear Power Generating Stations
 17. PAR Extensions approved
 - PC37.105 IEEE Standard for Qualifying Class 1E Protective Relays and Auxiliaries for Nuclear Power Generating Stations
 18. Modified PAR approved
 - PC37.91 IEEE Guide for Protective Relay Applications to Power Transformers
 19. Modified PAR Submitted

PC37.91 IEEE Guide for Protective Relay Applications to Power Transformers

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
February 15, 2008	March 25, 2008
May 2, 2008	June 4, 2008
August 15, 2008	September 24, 2008
October 20, 2008	December 8, 2008

I. Substation Committee Report

Dood

No Report

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

The group met on Tuesday January 8th with 7 members and 1 guest present.

Solveig Ward agreed to become the vice chair of the working group.

The question of service awards was discussed and how often they should be passed out. It was agreed that service awards should be passed out at 5 year service intervals beginning with the 15th year.

The idea of a long-term chair for this working group was discussed and supported. This was presented at the officers meeting. The idea was also supported by the officers and left to Bob Beresh to find someone who may be willing to take on this responsibility.

Bob Beresh will discuss with Bob Pettigrew about the logistics of the financial matters dealing with Canadian and US border issues regarding award shipping and payments for awards.

Certificates of Appreciation were handed out to: Tony Seegers – SC Chair System Protection, Roger Hedding – SC Chair Line Protection, Eric Udren: Chair WG I5, Mike McDonald: Chair WG D6.
19 Service Awards were handed out for those with years of service from 17 through 26.

B2: Fellows Awards

Chair: J.S. Thorp

No Report

B3: Membership Committee

Chair: M.J. Swanson

Attendance during the PSRC meeting was approximately 211. This is considered excellent, even with our joint meeting with other PES Technical Committees and CIGRE.

20 new attendees were in our Newcomers Orientation meeting on Tuesday, which is considered excellent participation. Two attendees returned after a year's absence. I contributed to the presentation.

No management support letters were written.

17 Service Awards were presented on Thursday.

B4: O & P Manual and WG Training

Chair: R. Hedding

A working group chair training session was held Tuesday morning, January 8, 2008 with 12 people in attendance. The contents of the last training session "Responsibilities of a Working Group Chair" was reviewed. The majority of this training session dealt with the time line for a working group to complete it's assignment. Another training session will be held next January. A website with the materials presented at the meeting will be established for future reference.

B5: Bibliography and Publicity

Chair: T.S. Sidhu

Vice Chair: M. Nagpal

The WG met on Jan.8, 2007 with four members and one guest in attendance. The Chair indicated that the 2006 bibliography paper has been approved for publication in the IEEE Trans. on Power Delivery. Assignments for preparing the 2007 bibliography paper were made. Mal Swanson will work with the PSRC Chairman to assist in preparation of the publicity report. There have been no NERC reports to review. WG Chair has provided more than 70 years of bibliography (in word files) to PSRC webmaster (Russ Patterson) for possible creation of a searchable database and this possibility is being investigated.

B8: Long Range Planning

Chair: Phil Winston

No activity to report.

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 19th, 2007, in Charlotte, NC with 18 members and 33 guests in attendance.

6 Working Groups and 1 Task Force met at this meeting. The members of the Subcommittee approved the minutes of the May 2007 meeting.

A new WG Chair was appointed for C13 – Undervoltage Load Shedding as the previous chair, Art Buanno, will no longer be able to attend PSRC.

The Subcommittee approved the formation of Working Group C16, Relay Scheme Circuit Design Using Microprocessor Relays. The WG Chair will be Ken Birt, Vice Chair Raluca Lascu, and will produce a report to the Main Committee.

PSCE liaison report: nothing to report.

PSSC liaison report: Nothing to report.

Cyber Security: Steve Kunsman reported on a Task Force meeting held as HTF3. As utilities must be “substantially” compliant by 06/2008 and fully compliant by 12/2008, there is much work going on. One of the main issues is how to interpret the standard. There was a discussion whether this group logically belonged to C as the previous Cyber Security work group. While communication security is of great importance, cyber security also encompasses other aspects of relying. It was decided to keep it as HTF3 Task Force for the May meeting and then decide where it belongs. It might be possible that several working groups are created, separately addressing H and C issues.

Reports from the WG Chairs

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

Chair: V. Madani

Vice-Chair: M. Begovic

Output: Survey

Established: September 2004

Expected Completion Date for the Survey: May 2008

Summary Meeting Notes:

WG C-4 met on January 8 in one session with total 10 in attendance (6M, 4 G).

WG members are in the process to transfer the survey responses to the spreadsheet that has been developed for the purpose of tabulating the results was reviewed. Five members have volunteered to assist in extracting responses from the survey to the spreadsheet. In transferring the responses into the spreadsheet (a manual process), there seems to be a uniform interpretation of the questions, and no ambiguity seems to be in the questions or that the respondents have had a need for further clarification or information.

The attendees also discussed ways to best capture comments that some respondents have provided in their survey. Vahid, Miroslav, and Victor Ortiz are looking at options. We are still receiving responses to the survey if anyone is interested. Miroslav and Javier are also contacting many of their contacts and CIGRE members internationally to encourage greater participation.

The next topic discussed was the draft outline for the report. Stan Horwitz volunteered to prepare the initial outline and the WG members will be assigned to different sections to start writing the sections. The first draft of the report will be circulated before the May meeting for purpose of discussions at the May 2008 meeting. It was also agreed that if we receive additional responses while in the process of preparing the draft paper, the responses received will be accepted.

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 May 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

WG C9 met on January 8 in a single session. The WG discussed the progress of the summary transactions paper.

The group plans to meet for the last time in May 2008. Meeting room requirements for May are: 30 people, powerstrip, projector, single session.

C11: Guide for Protection System Testing

Chair: V. Madani

Vice-Chair: H. DoCarmo

Output: Guide

Established: May 2005

Expected Completion Date: August 2008

WG C-11 met on January 8 in a single session with total 27 in attendance (13 M, 14 G). After review of the patent slides, the WG members reviewed comments from multiple reviewers followed by edited contributions based on reviewer's suggestions. The following writing assignments were discussed:

- Reviewer Comments Received
- Sect. 2.6.4 Updated Dynamic Simulation Testing
- Sec. 5.1.2 (Functional Testing of IEC 61850-based applications), Additional virtual wiring testing
- Power Line Carrier Equipment tests

The WG members were encouraged to submit their comments as the WG members are finalizing the Guide by mid February and start the process for forming the balloting body and official process for review by the IEEE.

The Subcommittee Chair proposed that WG seeks subcommittee approval to proceed. 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 C Subcommittee members are in favor of proceeding the balloting body. Suggestion was made to send a reminder to the C subcommittee members to encourage the Subcommittee members to join the balloting pool.

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 with 11 members and 10 guests present. The meeting was chaired by Damir Novosel, the WG Chair.

Prior to the meeting, Final Draft 10a of the Working Group Report was distributed to the members and guests on the mailing list. This draft included reviews and updates of few remaining chapters and a final editorial review of the whole document. The complete document has already been reviewed by four WG members prior to the September 2007 meeting.

The document is very close to completion, should be finalized by the May 2008 meeting and sent to C SC for approval. Following steps are planned by May 2008:

- Gene Henneberg and Demetrios Tziouvaras will review Draft 10a of the document to assure that their comments have been properly incorporated. Gene Hanneberg will also add a short contribution on how voting schemes improve security and dependability and, consequently, reduce impact of stressed system conditions.

By March 15th, 2008.

- The final document will be sent to the members and guests on the mailing list for any final comments.

George Bartok/Damir Novosel by April 1st, 2008

- The WG members will review the final document and provide final comments.

By May 1st, 2008.

- If there are no major comments, the document will be sent to C SC for approval. If there are major comments, they will be resolved at the meeting in May 2008.

To decimate information from this report to the wider audience, the WG members and guests proposed to submit and present the report at the following conferences: Western Protective Relaying Conference and MIPSICON in 2008; and Georgia Tech and Texas A&M Protective Relaying conferences in 2009. The report will be submitted as is. It is also proposed to write an IEEE Transactions paper to create a reference paper with wider distribution. To prepare a presentation for the conferences and to write an IEEE paper, a new WG is proposed.

For the next meeting, a single session with a room for 40 people and a computer projector are needed either to finalize the report or to start a new WG to create a presentation for conferences and an IEEE paper.

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 January 9 with 19 in attendance. This included 10 members and 9 guests.

Discussions on the latest draft:

- Reviewing the definition of SIPS architecture and summary of advantages & disadvantages
- Voltage threshold setting issue considering critical voltage from P-V analysis. Reasonable or not?
- Rate of change of voltage issue

Open sections & volunteers for assignments:

- Coordination between UFLS and UVLS will be written by Burger
- 2.2.5 Voltage reduction and LTC blocking, and 10.1.1 1989 Quebec will be written by Begovic.
- Under 5.2.1, Begovic and Novosel will contribute Adaptive scheme.

- 6.3 Impedance locus detection will be written by Novosel and Begovic
- The paper describing 1987 France incident will be prepared by Begovic and sent to Imai
- 6.1.1 Voltage Slide Scheme and 10.2.3 2001 Peru will be written by Imai based on available papers.
- Rate of change of voltage recovery issue will be added under 6.2 by May and Cunico with GPC.
- GPC UVLS scheme will be added by May and Cunico under chapter 9.
- Conclusion will be prepared by Imai.

Timeline of the activities

- May, 2008 – Complete the final draft
- January, 2009 – Finish the report

We request a projector and a room for 30 people at the next meeting. At this time, we request a time allotment for a single session.

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.

C14 met for the first time as a working group on January 8, 2008, in San Antonio, TX, in a single session chaired by Jim O'Brien with 7 members and 24 guests. One guest expressed the desire to join a working group as a member.

Two presentations were given at the meeting. Shinishi Imai of TEPCO, Japan, presented "Experiences of SIPS Using Information of Phase Separation". Dr. Yoshizumi Srizawa of Central Research Institute of Electric Power Industry, Japan, gave a presentation "Modular Device Architecture for Wide Area Measuring, Protection and Emergency Control".

The chair distributed the initial draft of the proposed outline, which was discussed by the group. Since the outline included System State Measurement topic, which did not seem to be consistent with the topic of the relaying applications, it was subsequently dropped.

Also, it was proposed to clearly define the term Time Synchronized Measurement before proceeding with defining the outline. The WG title was proposed to be changed to *Use of Synchrophasor Measurements in Protection Applications* based on the discussion of applicability of synchrophasors vs. broader term of time synchronized measurements and the fact that current and potential utilization of the synchrophasors is in wide area system protection vs. in an individual protective relay.

If other members desire to give pertaining to the topic presentations at the next meeting, they are encouraged to do so and should contact the chair or vice-chair to be included on the next meeting's agenda.

Requirements for the next meeting are as follows: single session, meeting room for 35 people with a computer projector.

CTF15: Testing and Design of SIPS

Chair: Y. Hu
Vice-Chair: R. Cummings

Task Force CTF-15 did not meet in January, 2008.

The Task Force CTF-15 is scheduled to meet in May 2008 to define the scope and the product of this future working group. Task force chair will take the lead to prepare a straw man statement and present it at the next meeting.

CTF16: Relay Scheme Design for Modern Relays

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

Proposed Working Group Title: Relay Scheme Circuit Design Using Microprocessor Relays

CTF16, Relay Scheme Design for Modern Relays, met for the second time on Tuesday, January 8, 2008. There were 49 people in attendance.

There was considerable discussion about topics that should be included in the project scope if a working group is formed. Some comments pertained to the proposed title and if the 1999 PSRC report 'Relay Trip Circuit Design' should be kept intact.

Proposed assignment: Write a supplement to the existing 1999 relay trip circuit design report as an IEEE PSRC 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

Requirements for next meeting: 1 session, room size of 50, computer projector.

CTF16, Relay Scheme Design for Modern Relays:

Met for the first time on Tuesday, September 18, 2007. There were 58 people in attendance.

D: LINE PROTECTION SUBCOMMITTEE

Chair: M.J. McDonald
Vice Chair: Russ Patterson

The Subcommittee meeting was called to order at 4:30 pm on January 9, 2008 with 25 members and 37 guests.

After introductions, the September 2007 meeting minutes were approved.

ADCOM items of interest

- The PSRC is looking into another Joint Meeting in January 2009. Attendees will be receiving a PES and PSRC survey in regard to this Joint Meeting – attendees were encouraged to provide comments and suggestions.
- All Working Groups are encouraged to get their web pages up-to-date as soon as possible.

The meeting was adjourned at 5:25 PM at which time Bogdan Kasztenny made a presentation on distance relay performance at off-nominal system frequency comparing relays with and without frequency tracking capability.

Reports from the WG Chairs:

D1: Cold Load Pickup Issues and Protection

Chair: Dean Miller

Vice Chair: Tony Sleva

Output: Report to PSRC

Expected completion date: Early 2008

Draft 8

Working Group D1 met in a single session on Wednesday, January 9, 2008 with 8 members and 6 guests in attendance.

The changes made to the report between Draft 6 and Draft 8 were discussed.

Ratan added to clause 6.3, Microprocessor Relays, the usage of the detection of inrush current to automatically modify the relay configuration.

The working group accepted all of John Tengdin's revisions except for the changes to the pre-event load currents in example A.1 which differed from the numbers on figure 2 and 3.

Don Parker will review data that Alabama Power has on newer non linear loads to see if this type of load is correctly described in the paper. He will be getting back with those results within three weeks. Based on the outcome of his work either the paper will be going to the PSRC officers for approval with the changes that came out of this meeting or a new draft will be distributed to the Working Group members for approval. This new draft will include Don's revisions.

It was decided that the paper will be submitted for presentations at the regional relay conferences, starting with the Western Protective Relay Conference. The working group members interested in presenting the paper will work on PowerPoint slides for the presentations.

The working group does not plan to meeting in May.

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: September 08

Did not meet.

D5: Guide for Protective Relay Applications to Distribution Lines

Chair: Phil Waudby

Vice Chair: Randy Crellin

Output: IEEE Guide PC37.230

Established: January 2002

Expected Completion Date: PAR extended to 2008

The working group met on Tuesday afternoon, January 8th, in a single session with 28 attendees (16 members and 12 guests).

After introductions, slides and acknowledgement of the IEEE-SA Guidelines on Patents, reading of the working group scope, and approval of the September 2007 minutes, we briefly discussed the current status of the working group:

- The guide was approved.
- It will be published in spring (anticipating March).
- IEEE is having problems with the figures.
- The summary paper was reduced from 20 pages to 13 pages.
- Finished reviewing the summary paper comments this session.
- Need to develop PowerPoint slides for future presentations.

Charlie Henville stressed the importance of writing a “brief” summary paper as an advertisement for purchasing the guide and not a substitute for the guide.

The working group reviewed and made comments on the summary paper writing assignments, which included editing the paper as agreed upon. Several sections were removed or consolidated in an effort to improve and reduce the size of the document.

Mike McDonald, Roger Hedding, and Randy Crellin volunteered to review the remaining few pages (9-13) of the paper and submit comments and/or revisions by January 18th. The paper will be sent to the officers and working group members for final review.

Rafael Garcia and Rick Taylor are currently planning on making a “Guide” presentation at the upcoming Texas A&M Relaying Conference in April. The working group needs to help develop PowerPoint slides to aid presenters in this and future conferences. Phil Waudby asked for more volunteers to assist in these efforts. Volunteers were requested to contact Phil if they were interested in working on the slides and/or being future presenters.

We are not planning on needing any future meetings.

D8: Justifying Pilot Protection on Transmission Lines

Chair: Gary Kobet

Vice Chair: Bogdan Kasztenny

Output: Report to the Subcommittee

Meeting #10

Draft: Final

The WG met on January 8, 2008 with 23 in attendance: 12 members and 11 guests. The minutes of the September 2007 meeting were approved as printed.

The Chairman provided an update on the review of draft 5 by the Subcommittee and PSRC officers. Few minor changes have been requested, and are implemented in the final draft.

During the meeting, a few editorial changes were identified, discussed, agreed upon and implemented.

A disclaimer has been proposed to state that the list of considerations for pilot protection covered by the report is not bounded, and other considerations may exist.

Phil Winston asked if the report is equivalent to mandating pilot protection at a certain voltage level and above. The issue was discussed, and a conclusion was reached that no such mandate can be derived from the content of the report. A comment was made that performance requirements are key, and in many cases they can be met only with pilot protection, but no mandate for pilot protection is justified.

The WG declared the work complete.

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 in a single session with 19 members and 13 guests present. Mho Sachdev was not able to attend and on his behalf, Vice Chairman Simon Chano chaired the meeting. Members and guests discussed the status of draft 2 which was sent by Moh prior to the September meeting. A big issue is non consistent definitions between C37.113 and C37.100.

The WG discussed the new contribution to the guide regarding redundancy and backup functions. Simon Chano requested all members to review draft 2 for technical content and submit their input to Moh as soon as possible in preparation of draft 3.

We request single session for 35 persons with a computer projector.

D11: Effect of Distribution Automation on 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 with 11 members and 17 guests present. The WG membership is now 18 with the addition of three new members: Pat Heavey, Steven Hodder, and Victor Ortiz.

Minutes from the Charlotte meeting were read and approved and the WG welcomed Georges Simard from Hydro Quebec to our meeting. Georges is the chair of the T&D Distribution Automation working group and would like to exchange information between the two groups to share expertise and avoid duplication of work.

During the review of the outline, clause 6.10 Distributed Resources was added. A few items held over from review of sections 5 and 6 at the Charlotte meeting were discussed. Don Lukach will get with Pat Carroll to clarify definitions in Section 5 (Distribution Automation Schemes) and have them ready for the May meeting. Pat Heavey also volunteered to review section 5 and comment back to Pat and Don. While reviewing the outline on section 6, the subject of effects of DG on protective relaying associated with distribution automation came up. We decided to add a few sentences (high level) in 6.1.1 on dealing with DR during reconfiguration of the network.

The WG continued to review Draft 1.0 of the report covering Clause 7.

The WG has not yet received material on a DA project from Mani Venkata. Writing assignments are due on April 11.

Requirements for the next meeting: single session, meeting room for 30 people with a computer projector. This meeting will be draft 2.

Avoid conflict with WG K9.

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

Did not meet.

D22: Performance Testing of Transmission Line Relays for Frequency Response

Chair: Tom Weidman

Vice Chair: Solveig Ward

The D22 meeting met Wednesday, Jan 9, 2008 at 11:00 am with 10 members and 11 guest present. Sam Sambasivan from Areva joined the working group bringing the WG membership to 16. This was the WG's second meeting since the transition from a task force to the WG.

The draft outline of the WG report was discussed and writing assignments made. The WG discussed the "strawman" draft of a frequency response test. This test varies frequency and voltage at various rates to determine relay function performance. This test will be converted into a Comtrade test format as a next step.

The WG was eager to hear the presentation from Bogdan Kasztenny at this D SC meeting.

WG requests a meeting room for 25 with a computer projector for the May meeting.

DTF24: 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 on the justifications and application criteria for directional ground overcurrent relays applied for protection of transmission lines.

The working group met with 8 members and 11 guests present, chaired by Rick Taylor.

The working group discussed the primary assignment to provide input to WG D9, PC37.113, Guide for Protective Relay Applications to Transmission Lines. The focus or limitation is the application of time ground overcurrent relays where ground distance relays are used. Section 6 of the latest available Draft PC37.113 will be sent to the D24 WG members with the intent of determining the best location for the D24 information.

The working group also discussed the expanded assignment that includes the application of directional ground overcurrent relays where ground distance relays are not used.

The Chairman and Vice-Chairman switched positions.

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

Liaison Reports

Alex Apostolov indicated there was no new information regarding IEC TC57.

Coordination Reports

None

Old Business

"C37.104 Guide for Automatic Reclosing of Line Circuit Breakers for AC Distribution and Transmission Lines" re-affirmation ballot and re-ballot has closed. Gary Kobet will Chair task force DTF2 which will meet for the first time at the May meeting to review the re-affirmation ballot comments in order to determine if a Working Group needs to be formed to revise the Guide.

New Business

WG D8 Justifying Pilot Protection on Transmission Lines, Chaired by Gary Kobet, has completed its' work and is officially disbanded. Gary will make a presentation on the groups work at a future Main Committee meeting.

Dean Miller proposed looking at fault study modeling of Wind Turbine Generators. Rick Taylor will provide a contact to the PES Wind Turbine Energy Group.

High Impedance Fault Activity

None reported

H: RELAYING COMMUNICATIONS SUBCOMMITTEE

Chair: A. Apostolov

Vice Chair: V. Skendzic

The Subcommittee met on 01/10/08 with 24 members and 36 guests. Minutes from the September meeting were approved.

Reports from the WG Chairs

H1: Guide for Application of Digital Teleprotection

Chair: M. Benou

Vice Chair: M. Allen

Output: Guide

Established: May 2006

Expected Completion Date: September 2011

The working group met with 9 members and 12 guests in attendance, chaired by Marc Benou. Roger Ray acted as vice chair.

The September minutes were distributed and approved by those members who were present. A quorum was not present so a request to approve the September minutes will be sent to the members of the working group who were not able to attend. The IEEE patent policy was distributed.

Draft 1.2, with the latest writing submittals was handed out. The working group discussed the merits of including as much material as possible, with a few exceptions such as environmental standards, in the guide versus referencing other preexisting papers, reports and standards. The consensus was to include the relevant material in order to make the guide as complete as possible and to avoid the user from having to reference more material than necessary.

Mal Swanson reviewed the schemes that should be included in the guide. The working group agreed that all but zone acceleration should be included and direct transfer trip should be added, including diagrams.

The group began the first review of the draft guide. It was agreed that section 4 should have a digital section to the existing analog transfer trip communications. Marc Benou took the assignment. Section 4.2 will have the relevant sections of IEEE 487-2000 (or latest version if it exists) added and have digital copper GPR issues added. Etienne Fortin will be contacted and requested to make these modifications. It was agreed that section 4.3 should discuss the possible connection problems that relay engineers using digital interfaces might encounter. Bob Ince volunteered to add these details to this section. Bob also agreed to add LC connectors to section 6.1 at Roger Ray's recommendation. It was recommended that section 4.7 include a list of relevant IEEE environmental standards and other environmental standards be added to the reference section of the guide. Mark Simon volunteered to make these additions.

The working group was reminded that the users of this guide requested that it include as much compare and contrast, plusses and minuses as possible and for them to keep that in mind as the work progresses.

1.2 focused on the level of complexity desired by the working group in each subject. The working group was asked to review the submitted sections, which vary in the level of detail, so that the working group can come up with a consensus with how detailed each section should be. This will help members with their writing assignments

There are 8 subsections left to be assigned. Members that have not turned in writing assignments were reminded to do so.

The chair is responsible for trying to make the draft conform with the IEEE-SA standard format. Draft guide 1.2 and the January minutes will be distributed to the working group. Writing assignments are due to the chair by April 18, 2008.

H2: Broadband Communications Over Power Line Carrier

Chair: M. Simon

Vice Chair: TBD

Output: Report to the Subcommittee

The BPL Working Group is meeting approximately once per year to stay abreast of BPL technology. The Working Group recognizes that BPL and other technologies will be providing communications capabilities where they were limited or non-existent. The Working Group will be able to recognize the fit that BPL has on future protection technologies, as well as, perhaps recognizing where it will not fit.

During the Working Group meeting the status of the technology was discussed. Speeds up to 200 Mb/sec have been achieved. It is not known speeds this fast are actually making their way to the field.

The radiated noise aspect of BPL was discussed. It was noted that there are some systems that utilize technology that emit levels of noise that are more tolerable to the Amateur Radio Community than others.

BPL technology has the backing of several large companies. DirecTV and Google were mentioned.

There is a movement towards having what is being called a "Smart Grid". While this means different things to different people, in the perspective of the power system protection community it may allow some enhanced capabilities. The PSRC should be looking at all of the technologies and standards that apply to Smart Grid. How can Protective Relaying make use of these technologies?

The Working Group output will be a web page with links to content of interest. Additionally, the Working Group will make proposals to the PSRC H Subcommittee for specific areas of investigation or assignment.

H3: Time Tagging in Protection and Disturbance Recording IEDs

Chair: B. Dickerson

Vice Chair: J. Hackett

Output: Recommended Practice

Established: Sept. 2006

The working group met on January 9, 2008 in a single session with 10 members and 11 guests, chaired by Bill Dickerson.

The IEEE Patent Policy slides were shown, and an opportunity was given for attendees to disclose any patent issues. None were identified.

Jim Hackett mentioned that Vice-Chair Jim Ingleson, who has retired, may no longer be actively involved in PSRC meetings and that if this is the case, he (Jim Hackett) would be willing to serve as Vice Chair. The Chair will contact Jim Ingleson to verify.

Writing assignments contributed by two working group members were presented and a discussion followed. The group suggested changes and additions to the section on Correlation and Data Interpolation, mostly relating to different interpolation algorithms, their strengths and weaknesses, and examples. The group also discussed the Analog Inputs section and there was a discussion about the effects of trigger settings on reported event times. The authors of those sections will incorporate the suggested changes and additions into their contributions.

The Subcommittee Chair suggested that we add a section and/or diagram at the beginning of the document that clearly shows the problem we are addressing and where the various errors originate. The WG Chair agreed to take this on as an assignment.

The working group now has 20 members. Numerous guests have attended one or more sessions.

H4: Revision of C37.111 COMTRADE Standard

Chair: R. Das

Vice Chair: A. Makki

Established 2006

Output: Standard

The Working Group H4, met on January 8, 2008. Fifteen members and six guests were present.

Minutes of the September 2008 meeting were approved.

We had a presentation by Pierre Martin on XML based COMTRADE. Discussions were held on Draft 3, primarily on XML based COMTRADE. WG members will decide about the incorporation of XML based COMTRADE by ballot. Draft guide will be balloted among the WG members before the next meeting.

H5-a: Common Data Format for IED Configuration Data

Chair: J. Holbach

Vice Chair: D. P. Bui

Output: Report

No report submitted.

H5-b: Common Data Format for IED Event Data

Chair: M. Adamiak

Vice Chair: P. Martin

Output: Report

WG H5-b met on Wednesday with 8 members and 7 guests in attendance. The meeting started with an overview of the project to date and the present status of the schema. Several changes were made to the schema based on discussions from the last 2 meetings. Specific changes were made to:

- Take into account the XML format for COMTRADE
- Use of namespaces
- Add Version and Revision number
- Add Time Quality according to C37.118
- Add Time Offset
- Add new IED data: Serial Number, Firmware Rev., ...
- Add new definition of the Payload data with extension capabilities

A name has been proposed for the format: COMEVENDE (Common Format for Event Data Exchange).

During the presentation, Erich Gunther pointed out that there is PAR with almost the exact same scope in the Power Quality WG. The Mark and Pierre will coordinate with Erich to see if coordination is possible. In addition, the following changes are to be made to the schema:

- All analog values are to be presented in Primary SI units. Transformer ratios will also be available for applications needing to deal with secondary values.
- Definitions for the various Event Types are to be added (Mark to add)
- Add "Type of Fault" to the fault report

Once the schema and the report are updated, the report will be issued to the WG members and the Subcommittee members for voting.

H5-c: Common Data Format for IED Sampled Data

Chair: B. Vandiver

Vice Chair: B. McFetridge

Output: Report

The working group met on Wednesday, Jan 9, 2008, with 10 members and 11 guests present following sessions with H5-a and H5-b. The meeting minutes from the September meeting in Charlotte were approved by the group. The WG advisory information was presented and reviewed as prescribed by the PSRC and opportunity provided for membership response.

The final Draft of the report was reviewed with focus on the last editorial changes from Christoph Brunner, and brief review of the content for those new guests attending. The report was put to a vote and unanimously approved by the WG members.

The final report is therefore respectfully delivered to the Chair of the H-Subcommittee for distribution to the membership for review and approval. If there are any comments or corrections, please direct them to Benton Vandiver, H5-C chair by phone (713-830-4660) or email (bav3rd@attglobal.net).

An abstract for a summary paper on this report was submitted to the Fault & Disturbance Conference at Georgia Tech for 2008 on the recommendation of the H Subcommittee chair and it was subsequently accepted at the conference. Therefore a request for volunteers was issued to help in authoring the summary paper of which Stan Thompson, Christoph Brunner, Alex Apostolov, and myself will participate. The WG will also be prepared to make a similar presentation at any future subcommittee meeting.

The H5-c working group having completed the scope of its work does not foresee the need for any additional meetings, but should remain active until the subcommittee presentation is complete.

Report Status: Report approved by H5-C Members and provided to subcommittee for review.

H6 Substation Ethernet

Chair: J. Burger

Vice Chair: C. Sufana

Output: Report

Working group met with 40 guests and members. Summary paper was discussed, along with 6 applications of GOOSE messaging submitted by the members.

UCA Report: UCA group will meet at DistribuTech the week of January 21st.

Christoph Brunner provided the update on the latest IEC 61850 activities

H7: Comparison of IEEE / IEC Teleprotection Standards

Chair: M. Simon

Vice Chair: E. Fortin

Output: Report

H7 met with 11 members and guests on January 8th 2008.

The final version of the document and a introductory note. The two will be posted on the H section of the PSRC web site shortly after the January PSRC meeting.

The standards on the list were reviewed to identify specific areas in which the PSRC should further investigate the subject matter. During the compilation process, several IEC standard relating to transients, noise and dropouts on the DC power inputs identified. The PSRC has done little work in this area with the exception to SWC and Fast Transient. The working group chair will write a letter to the chair of the I subcommittee recommending that a task force be formed to look at the IEC standards, coordinate with them, bring some of the topics into existing standards, or take on no activity.

The working group will be disbanded after the web publication.

H8 File Naming Conventions

Chair: A. Makki

Vice Chair: R. Cornelison

Output: Standard C37.232

The group met with 6 members and guests present.

The group developed an outline for the summary paper of C37.232 to be presented at the Fault and Disturbance Analysis conference in May 08. To that extent, the summary paper will be completed and circulated to the communications subcommittee for their review prior to March 08.

The group does not need to meet again during the next meeting. However, the working group will be kept active so it can complete the summary paper and brief the subcommittee. WG will request permission to disband during the next meeting.

H9 Understanding Communications Technology for Protection

Chair: M. Sachdev

Vice Chair: M. Benou

Output: Report

The H9 working group did not meet.

H10 Naming Installed Intelligent Electronic Devices (IEDs)

Chair: R. Cornelison

Vice Chair: J. Hackett

Output: Paper

Introductions, 6 members, 1 guest.

There was discussion to change the name of the working group to avoid confusion with C37.2 (Device Function Number Standard). All of the attending members agreed on changing our name to: Naming Installed Intelligent Electronic Devices (IEDs)

WG assignment was discussed and modified to: Create a PSRC Report that describes a convention to uniquely identify (name) installed Intelligent Electronic Devices (IEDs) including measured and calculated quantities for the purpose of sharing data collected by these devices.

The first draft of the outline was created.

Assignments to create and conduct survey of current practices were made.

H11 C37.118 Standard for Synchrophasors for Power Systems

Chair: K. Martin

Vice Chair: B. Kasztenny

Output: Standard

The WG met on January 9, 2008 with 12 members and 18 guests. The IEEE-SA Standards Board Bylaws on Patents in Standards have been brought to the attention of the WG.

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

The Chairman provided an update on the IEEE Transactions paper publicizing the 2005 revision of the standard. The paper has been approved for the upcoming issue of IEEE Transactions. A call for volunteers followed to present the work at regional relay conferences and other forums. A version of presentation has been developed for this purpose. The work will be presented at the IEEE PES Summer Meeting.

An update has been given on the dual logo approval process. The IEEE (Jodi Haas) will send a memo to the IEC central office inquiring about the process, and if no process available, will suggest a group of experts from both bodies to work together toward the mutual approval.

Two requests for clarifications have been received prior to this meeting: quality flags for the time lock function, and time offset for the local time zone. Ken Martin presented the suggested interpretations, which have been approved and will be posted on the C37.118 clarification web page.

Bill Dickerson brought out a proposal for mandating PMUs without an integrated GPS receiver to use the quality information from the IRIG-B or other synch methods. Veselin Skendzic signaled the need to standardize the translation between the time quality information in the extended IRIG-B format with the C37.118. These will be addressed in the new standard.

The Chairman presented a draft of the proposed PAR. This includes frequency and rate of change of frequency definition, measurements under dynamic conditions, harmonization with IEC 61850, and file formats for local storage. It was decided the file format discussion will be provided in an informative Annex. New items have been added: definition of a PDC and latency considerations. It was suggested the two items will be included in Annexes, most likely informative Annexes.

Arun Phadke and Bogdan Kasztenny distributed their paper on dynamic phasor measurements with proposals for the WG. A discussion followed.

Bill Dickerson expressed a concern regarding harmonization with IEC, in the context of IEC 61850. The concern was whether IEC acceptance depends on adding IEC 61850 or adding it and removing the C37.118 communication framework. This will be in the focus of co-operation with the TC57.

The Chairman requested comments on the draft PAR by February 1.

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 held its initial meeting on January 9, 2008 with 30 attendees.

The Report is to be written an outline based on inputs from the Task Force HTF2 phase of the project, now concluded. The chairman presented the outline for editing by the WG; attendees made important additions. The goals and target audiences are identified up front and reflected in the contents. 11 authors have agreed to write sections and subsections; a few more need to be recruited between sessions or as the earlier sections evolve.

A date for submission of initial drafts was not set as the WG ran out of meeting time. However, the Chair requests here and by e-mail that volunteers named in the attached Report Outline reply to the Chair and Vice Chair by January 30 confirming that they can (or cannot) submit initial drafts by March 28. Be as complete as possible, but do not let missing pieces or coordination questions prevent the submission of a section with some holes to fix later.

The WG will meet in Kansas City to review initial submissions and integration. The meeting scheduling should avoid conflict with H6, H11, HTF3, or I4.

H14 Telecommunications Terms Used By Protection Engineers

Chair: R. Ray

Vice Chair: R. Young

Output: Report

The H14 working group did not meet.

HTF1 IEEE 1588 Profile for Protection Applications

Chair: Galina Antonova

Vice-Chair: Bill Dickerson

Output: Profile (TBD)

Established: September 2007

The Task Force met on January 8, 2008 in San Antonio, TX in a singled section with 28 attendees.

Veselin Skendzic of SEL gave a presentation on IEEE 1588 fundamentals and profiles.

Main points discussed:

- Benefits of IEEE 1588. It allows the integration of timing and data into a single network, and meeting the timing requirements of substation IEDs.
- Profile examples. A profile includes parameters' default values and ranges, and allowed options. Default IEEE 1588 profiles may not be suitable for Power Industry applications. Two profiles may be required: an IED slave profile and PTP master profile.
- HTF1 output format was discussed. Options include:
 - IEEE Standard (1588 Profile)
 - IEEE Recommended Practice to be included into IEC 61850.

Bill Dickerson of Arbiter Systems gave a presentation on timing requirements for various applications.

At the next meeting we will decide on becoming a Working Group, our output and its content.

HTF3 Configuring Ethernet LAN Infrastructure

Chair: S Kunsman

Vice-Chair: E. Udren

Output: TBD

Established: January 2008

No report submitted.

Group met in double session with 53 members / guests.

Liaison Reports

Power System Communications Committee

S. Klein

S. Klein will be replacing E. Udren as our new PSCC liaison. Subcommittee H wishes to express its gratitude to Mr. Udren for many years of outstanding liaison service.

TC57, WG10, 17, 18 and 19

Ch. Brunner

IEC TC57 / WG10, 17, 18 are currently working on the following topics:

(1) There are two working groups (WG17, WG18), that adopt IEC 61850 for applications other than substations. These working groups prepare the following documents:

IEC 61850-7-510: use of the logical nodes defined in IEC 61850-7-410 to model applications for the control of hydro power plants

IEC 61850-7-420: object models for distributed energy resources – this is planned to be circulated as FDIS in the middle of this year

(2) Working group 10 prepares Edition 2 of IEC 61850. Edition 2 will incorporate many clarifications as well as new features used by other domains. Although included will be models for power quality. It is expected, to have a CDV of Edition 2 circulated in the first quarter of this year. A new part IEC 61850-7-500 will be prepared that explains the use of logical nodes defined in IEC 61850-7-4 to model applications of a substation automation system.

(3) A task force of WG 10 is addressing the use of IEC 61850 for communication between substations. One typical application is the communication used between two distance protection relays to implement the different teleprotection schemes. A draft report for comment will be circulated as IEC 61850-90-1 this month. Within the report, topics addressed are the communication architecture, the IEC 61850 modelling of the teleprotection equipment and the impact on the configuration using IEC 61850-6 system configuration language.

(4) Another task force of working group 10 is addressing the mapping of IEC 61850 on IEC 60870-5-101 / -104 as it is used in a gateway between a substation using IEC 61850 and the communication towards a control centre using 60870-5-101 /-104. A draft technical specification is currently being circulated.

In addition, a task force of WG19 is addressing the issue of using IEC 61850 for communication between substation and other field devices to control centres. It is planned to circulate a report IEC 61850-90-2 later this year. Related to that topic is the harmonization with CIM.

Coordination Reports

Old Business

Bruce Picket indicated that lack of visibility of the PSCC powerline carrier working group activities and volunteered to act as a liaison to our subcommittee.

C. Huntley reported on the latest IEEE efforts to pursue the IEC dual logo status for C37.94.

New Business

C37.94 reaffirmation ballot was initiated and is in progress.

I: RELAYING PRACTICES SUBCOMMITTEE

Chair: T. Sidhu

Vice Chair: R. Beresh

The Subcommittee met on Jan. 9, 2008 with 29 members and 16 guests.

- Approval of previous I minutes from Charlotte 2007 – approved
- The importance of getting WG minutes in as soon as possible was stressed to the membership
- ADCOM is looking for feedback/comments regarding joint meeting with PES, such as this present meeting

- Questionnaires will be sent out from the PSRC asking for input from the PSRC on joint meeting with eh PES
- WG using standards and guides as part of their development work will use secure web pages in the future to avoid copyright infringements
- The IAS is revising the colour book series and are interested in input from the PSRC.

Reports from the WG Chairs

I1: Understanding Microprocessor Based Technology Applied to Relaying

Chair: Moh Sachdev

Vice Chair: Ratan Das

Established: 2005

Output: PSRC Report

Expected Completion Date: 2008

I1 did not meet.

I2: Terminology Review

Chair: Mal Swanson

Vice Chair: Barb Anderson

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

January 8, 2008 Meeting

The I2 working group met at 11:00 am on Tuesday, January 8, 2008 with nine members and one guest. Mal Swanson chaired the meeting.

Minutes from the last meeting were approved.

Group #5 has been approved by the Officers, and Barb will have it added to the website. The working group revised several definitions according to comments from Walt Elmore. Mal will contact Amir and Moh regarding two other terms from their respective working groups.

C37.234: The working group approved the last two terms from this document, which were added to Group #6. Oscar mentioned that five new definitions have been added to the latest revision of this document. He will bring these to the May meeting.

PC37.105: Yuan Liao reviewed this document. The working group revised one term that will be added to Group #6.

C4 Working Group paper: Roger Whittaker revised definitions from this document. The working group began revising the terms and will continue at the May meeting.

The meeting was adjourned at 12:20 pm.

I3: Relay Functional Type Testing

Chair: Jerry Jodice

Vice Chair: Bryan Gwyn

Output: Report

January 9, 2008 Meeting

Scope of the working Group was agreed to be a series of functional tests that could show a particular problem related to system events. Individual problems will be submitted by members of the Working Group and a test report developed for that issue. The individual test reports will then be collated into a Working Group report.

It was agreed that this Working Group will be three years

The format of the report will be developed as individual contributions come in.

Working Group Assignments

Present a particular problem encountered by a utility at the next meeting in a form that can be turned into a report. Comtrade files to be included if possible.

The following people agreed to submit test reports:-

Bryan Gwyn & Jeff Pond

Jack Soehren

Bob Bentret

Steve Turner

Drew Welton

Reference Material

CIGRE SC 34.10 report

IEEE I13 report

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.

Meetings are continuing

The WG met on January 8, 2008 with 6 members and 4 guests, but one of the guests was Dr. Norbert Rochow, Convenor for a TC 95 WG that is writing some of the standards drafts we are reviewing. He thought he might attend some future meetings of PSRC.

There are several TC 95 drafts in circulation, as well as international comment summaries from other recently circulated drafts. The WG discussed three TC 95 CDV documents requiring a vote for the USNC in May, plus new functional standards being written by TC 95 Maintenance Team 4 chaired by Dr. Murty Yalla. The WG reviewed:

CDV for IEC 60255-3, Electrostatic Discharge Test – Only minor editorial changes – technically the same test. Relays are presented as being in Class 3 having an 8 kV discharge level withstand capability. IEEE C37.90.3 is 15 kV, like IEC Class 4, so IEEE compliant relay can easily pass the IEC test.

CDV for IEC 60255-22-5, Surge Immunity Test – Only minor changes from previously required IEC test – no longer refers to the old 60255-5. The test comprises high-energy surges that simulate induced lightning surges - 1.2/50 microseconds, 500 V to 2 kV depending on particular port tested, and low source impedances.

CDV for 60255-11, Interruptions to and alternating component (ripple) in ac and dc auxiliary energizing input of measuring relays and protection equipment. Test suite now includes 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. None of the tests raised concerns among the manufacturers who were present.

CD for 60255-151 - Functional standard for over/under current protection. This is a new update that absorbs, updates, and supersedes IEC 60255-3 and IEEE C37.112-1996. Murty Yalla reviewed comments by national committees on the first draft. The time delayed reset constants for the IEC curves need to be defined. The project should be complete within 2008. While not the subject of formal circulation, Murty reported on the status of 60255-127, under and overvoltage relays; and 60255-121, distance relays – both need some more work before a CD is circulated.

I7: Guide for the Application of Rogowski Coils Used for Relaying Purposes

Chair: Ljubomir Kojovic
Vice Chair: Veselin Skendzic
Output: Guide

Group met on Tuesday with 5 members and 2 guests.

The main conclusions are as follows:

1. The IEEE Document PC37-235, "Guide for the Application of Rogowski Coils used for Protective Relaying Purposes" was approved by the IEEE-SA Standards Board on 27 September 2007.
2. Prepared presentation of the Guide summary for the Main Committee.
3. An IEEE Transactions paper that summarizes the Guide has been submitted and is approved for publishing.
4. WG I7 completed its task and can be disbanded.
5. As continuation of work, WG suggests that I Subcommittee form a new Task Force to outline scope of work for a new WG that would cover practical aspects of Rogowski Coil applications for relaying purposes. Ljubomir Kojovic will chair new TF.

The WG has completed its task and was disbanded at the Subcommittee meeting.

I8: Guide for Applications of Optical Current & Voltage Systems

Chair: Harland Gilleland
Vice Chair: Bruce Pickett
Output: Guide

The working group did not meet.

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

Following were topics of discussion:

1. Attendance: Members: Marie Nemier, Mario Ranieri, Jeff Burnworth & Roy Ball and Guest: Steve Turner
2. The current draft will be circulated to the members for review. The current draft of the standard is 10-5A, dated August 2007. The draft will be updated to include the changes agreed to in the meeting.
3. The comments from the balloting in November 2004 were again reviewed. It was agreed that there were only a few remaining technical comments to address. Assignments were given to the attendees to resolve and propose wording for the standard.
4. Moira Patterson & Jodi Haasz informed the group that the previous ballot may not be able to be re-circulated after the comments are resolved due to the age of the ballot. They will let the group know upon return to the office.
5. It was agreed that information from the previous ballot needs to be obtained from IEEE. A complete copy of the comments received from balloters and the list of people who balloted.
6. An assignment was made to review the editorial comments to verify that all comments are purely editorial and not misidentified as technical.

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

Chair: Marie Nemier
Vice Chair: Munnu Bajpai
Output: Revision of Standard C37.98

Following were topics of discussion:

1. Attendance: Members: Mario Ranieri, Jeff Burnworth & Roy Ball and Guests: Jeff Gilbert & Mason Clark
2. The previous PAR had expired and new PAR would be completed before the February 15, 208 deadline.

3. It was agreed that the IEEE Power Engineering Society/Nuclear Power Engineering (PE/NPE) would become a joint sponsor of the working group. The standard is mainly used by the nuclear industry and it was agreed that the expertise of this group would be an excellent addition to the working group.
4. The current draft will be circulated to the members for review. The current draft of the standard is 3.0 Rev.1. The draft will be updated to include the changes made in C37.105.

I11: Timing Considerations for Event Reconstruction

Chair: Jim Ingleson

Vice Chair: Jim Hackett

Output: Paper

The working group did not meet. The WG has completed its task, the WG report has been approved and the WG was disbanded at the Subcommittee meeting.

I12: Revision of C57.13.1 – Guide for Field testing of Relaying Current Transformers

Chair: Mike Meisinger

Vice Chair: Don Sevcik

Output: Revision of ANSI/IEEE C57.13.1-1981 (R1992)

The working group did not meet. The WG requested to be disbanded as the work is complete. The WG has completed its task and was disbanded at the Subcommittee meeting.

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

The working group did not meet under I14 but met under a substation working group.

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

The working group did not meet.

I17: Trends in Protective Relaying Performance

Chair: Mark Carpenter

Vice Chair:

Output: Periodic Reports to Subcommittee

The working group did not meet.

I18 Anomaly Checks for Relay Settings

Chair: Peter McLaren

Vice Chair: Mukesh Nagpal

Output: Report to main committee

Meeting # 2 – 08/01/08

The WG met for a single session with 6 members and 11 guests.

Several participants gave examples of their utility's present practice for changing relay settings. A lively discussion ensued as to how best to ensure correct settings in IED's. Logic settings might also be changed and should be included in the committee's deliberations.

A draft questionnaire for issue to utilities was circulated and discussed briefly. The chair would circulate an electronic version to solicit comments for the next meeting. A second draft questionnaire would be prepared for issue to manufacturers and should be available at the next meeting.

Points of interest raised in the meeting were that Sweden does not allow remote setting changes and relay manufacturers might now be asked to provide some constraints on the way in which settings and/or logic are related (shells or macros?)

The chair indicated that any participant was welcome to submit a description of their present practice or suggestions for better practice.

The WG will meet in May for a single session and will require a room to seat 20 and a computer projector.

I19: Protective Relaying and Redundancy

Chair: S. Ward

Vice Chair: B. Gwyn

Output: Report to the main committee

Meeting #2

Estimated completion Date: Sept 2009

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

Output: Report

The Working Group met for a single session with 20 members and 12 guests in attendance on January 8, 2007.

This was the second meeting and as many assignments had been completed we already had a first draft with 30 pages.

One of the main discussion items at the meeting was how to use the NERC Draft Standard for Redundancy, and the white paper that served as a basis for the standard. It was decided to use material from these documents but not to limit our work by them. We expect our report to be broader and also hope that it may serve as an input to NERC for their standard work.

Draft 1 was reviewed and all unassigned sections received volunteers.

The working group will meet in May for a single session, 30 people, with computer projector, to continue work on the report.

Assignments:

As stated on Draft 1, due April 15 to the chair. The chair will incorporate these in a Draft 2 and distribute to all members for review at least 2 weeks before our next meeting.

I20: Revision of C37.90.1 SWC Tests

Chair: Tom Beckwith

Vice Chair: Tom Tennille

Output: Periodic Reports to Subcommittee

Meeting: Tuesday, January 8, 2008

The second meeting of the Working Group (WG) I20 met on January 8, 2002 in San Antonio, TX in a single session with 9 Members and 8 Guests.

The minutes of Minutes of Meeting #1 of September 18, 2007 were approved as submitted.

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

The WG discussed resolution of the comments submitted during reaffirmation previous balloting of IEEE Std C37.90.1-2002. All of these issues have been corrected with Draft 2 of IEEE PC37.90.1 with the exception of a comment objecting to the calibration definition. The WG voted to disagree with the objection to the definition as the current definition reads exactly as the definition in the IEEE Dictionary.

Barb Beckwith will verify that the terms appearing in Clause 3. Definitions of our standard are listed in The Authoritative Dictionary of IEEE Standard Terms, Seventh Edition or IEEE Std C37.100-1992 or are pending in the I2 Terminology Review WG.

Tom Beckwith found an additional problem in the existing standard in section C2 where the term $U_T@800@25^\circ\text{C}$ should read $U_T\approx 800@25^\circ\text{C}$. Steve Turner is to check to be sure there are no units associated with the "800" term.

The WG then discussed the need to correct C37.90.1-2002 regarding the appearance of documents in the "Reference" Clause versus the "Bibliography" Clause. With the assistance of Jodi Haasz of IEEE-SA, who fortunately attended our meeting at just the right time, the WG was able to decide which documents should be listed as References and which should be in the Bibliography. The WG also decided that the lengthy list of Bibliography items in C37.90.1-1989 that were removed in the C37.90.1-2002 revision should not be reconsidered for inclusion in the present standard.

Discussion was started on Clause 9.4 Exceptions and the exclusions that are permitted elsewhere in the standard. Discussion of this issue will continue at the next meeting.

Having determined that an Explanation rather than an Interpretation was needed in response to an official Request for Interpretation of IEEE Std C37.90.1-2002, the Explanation Response was sent to the WG, and the group was asked to consider whether the wording for Clause 8.2 Common mode tests and Clause 8.3 Transverse mode tests needs clarification.

Requirements for next meeting in May; Single session; 20 attendees; Computer Projector

ITF1 Manufacturer's Service Letter Database

Chair: Jerry Jodice

Vice Chair:

Output: Service Letter Database

Meeting as scheduled with five attendees,
New participants included Rick Cornelison of Alabama Power and Steve May of Georgia Power.
Others present: Bryan Gwyn, Mario Ranieri, Tarlochan Sidhu and Chair Jerry Jodice.

Status:

The PSRC collection of Manufacturer Advisories are all scanned and posted on the Doble portal for access.

Simply go to www.doble.com, and request your access code.

In the interim period, you may access all advisories at the portal using the temporary username of "gmarconi" and the access code of "jerry9"

A "Protection Test Methods" page is also available for future link to an IEEE site, in preparation for Reports developed by WG I3

A request for additional advisories was made to all ITF1 attendees, and I SC Members.

Tarlochan Sidhu made the request for additional advisories at the Main Committee Meeting on Thursday.

The Chair was requested to ask Manufacturers for any current advisories, so they may be posted for Users, as well.

Please send all Advisories to jajodice@ieee.org for processing.

ITF7 Schematic Representation of Power System Relaying

Chair: Kevin Donahoe

Vice Chair: TBD

Output: TBD

Meeting # 2 - 1/9/2008

The Task Force met for a single session with 11 members and 5 guests on Wednesday, January 9, 2008.

Reviewed minutes from Sept. meeting. Jim Niemira provided the group with a list of standards that are related to drawings and symbols. Members reported back on task force issues in their organizations. This discussion helped us arrive at the following proposed assignment for the group:

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

The content of this assignment has been agreed to however there may still be editorial changes to the statement itself. A possible outline was quickly reviewed. The group feels that there is enough interest that the task force should be made a working group and we look for the subcommittee's approval. Presently, I have two volunteers for the vice chair position. We will present one of these for subcommittee approval at the next meeting.

At the subcommittee meeting, the task force was approved for working group status and is now I5. The WG will meet in May for a single session, 25 people, with computer projector and power strip to start creating an outline and create a scope statement.

ITF8 Revision to Guide for Grounding of Instrument Transformers

Chair: B. Muligan

Vice Chair:

Output: Revision to Guide

ITF8 met at 8 AM on 1/9/08 with 5 individuals present. As all present were unaware of what additional changes to the Guide might be required since it was last approved, Vittal Rebbapragada offered to provide suggested topics for consideration by the next meeting.

Mike Meisinger on behalf of Brain Mugalian

Liaison Reports

Instrument Transformer Sub committee

The Instrument Transformer sub committee meets twice a year. Jim Smith, Chairman, C57.13 The Instrument Transformer Sub Committee C57.13 met last in Minneapolis, MN. October 16, 2007

Working Group on Test Requirements for High Voltage Instrument Transformers rated 115 kV and above met.

A number of revisions in C57.13.5 have been circulated to WG members and actions agreed upon.

PAR P1601 Optical Current and Voltage Sensing Systems-F Working Group met 10/16/07 and 10/23/07. A decision to start the ballot process was agreed to. The help needed to getting the draft ready for ballot was discussed. The draft was submitted to the editorial review ahead of the 10/16 deadline.

Coordination Reports

None

Old Business

None

New Business

None

J: ROTATING MACHINERY PROTECTION SUBCOMMITTEE

Chair: W. G. Hartmann
Vice Chair: K.A. Stephan

The Subcommittee met on 1/9/08 with 18 members and 15 guests. Minutes from the Sept 2007 meeting in Charlotte, NC were approved.

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: 2008

Status: Draft 5

The Working Group did not meet this session.

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 2

1. Introductions, 9 members, 2 guests
2. The WG reviewed and approved the September 2007 meeting minutes.
3. The WG reviewed Draft 2 of the paper and made the following assignments:

Abstract – Mike Reichard to write.

II. C of Machine Grounding Methods During Static Start

C. Ungrounded – Zeeky Bukhala to provide this section.

IV. Key Protection Elements and Considerations

- A. Dale Finney to revise Fig. 4 (page 4) and make the small sine wave solid and the constant wave dashed for easier reading, and include additional verbiage describing the simulation.
Mike Reichard to correct figure numbers.
Dale Finney to re-accomplish 6Hz simulations at approximately 0.25puV to coincide with stator voltage applied LCI during start.
- B. “Manufacturer B” figure. Mike Reichard to clarify device symbols with Toshiba regarding whether they are actual devices or functions within a controller. Wayne Hartmann to clarify/revise protection one-lines.

Assignments are due April 15, 2008

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 did not meet this session. The working group will produce a summary paper to be discussed at a working group meeting in May, 2008.

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. The working group will produce a summary paper to be discussed at a working group meeting in May, 2008.

J8: Generator Tutorial Revision

Chair: Michael Thompson

Vice Chair: Chris Ruckman

Established: 2007

Output: Tutorial (published by PSRC)

Expected Completion Date: TBD

Status: Draft 0.1

Assignment: Review and Revise 95-TP-102, "IEEE Tutorial on the Protection of Synchronous Generators."

The Working Group met for a single session with 18 members and 3 guests. 2 people joined the working group.

The minutes of the Charlotte, NC, meeting in September 2007 were approved.

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 1 is 2009. We are presently on draft 0.01.

Chair reported that drafts for six chapters have been submitted to date. Reports were given by the authors on the individual sections:

- Section 1 – C. Mozina reported that revisions to the section have yet to begin and that the section should include a discussion on machine capability.
- Section 2.1: Stator Phase Fault Protection – S. Kim reported that he and J. McElray have separated the writing assignment. Kim will do split-phase protection and McElray will handle phase protection. Kim submitted his half of the writing assignment.
- Section 2.2: Stator Ground Fault Protection (J. Uchiyama, W. Hartmann) – W. Hartmann gave an overview of section and indicated that J Uchiyama made a first draft and W. Harrmann revised it. It is ready for peer review.. M. Nagpal and D. Fredrickson agreed to review the document.
- Section 2.3: Field Fault Protection – S. Thakur noted that only a few changes were made to the section with the addition of phase overcurrent protection. The section should be ready for peer review within a month.
- Section 2.4: System Backup protection – C. Mozina may add material on from C37.102. A draft should be ready by the next meeting.
- Section 2.5: Gen. Breaker Failure – C. Ruckman reported that work has not yet begun. A draft should be ready by the next meeting.
- Section 3.1: Abnormal Frequency Protection – Benmouyal reported that work on the section has not yet begun. A draft should be ready by the next meeting.
- Section 3.2: Overexcitation and Overvoltage Protection -- R. Hamilton reported that it has not begun. He requested a co-author and D. Zinn volunteered. A draft should be ready by the next meeting.
- Section 3.3: Underexcitation/Loss if Excitation – M. Yalla reported that work on the section has started but is not yet complete. A draft should be ready by the next meeting.

- Section 3.4: Current Unbalance Protection – K. Stephan reported that the section review has not yet started. A draft should be available by the next meeting.

There was a general discussion on the length of the sections. The chair noted that the section on out of step protection is probably too long and needs to be distilled to approximately 10 pages. The intent is to keep the document usable and easy to read. To shorten section 3.6 some of the material could be moved to Section 1. C. Mozina will contact J. Gers to coordinate the material between the two sections.

M. Yalla reported that there were problems with the conversion of the pdf document into a clean word document especially the figures. At this point he is trying to move the figures and tables from C37.102 into the new word document. Will try to resolve all the conversion problems and send the the working group in the next few weeks.

Chair reported that S. Conrad had received copyright permission from the IEEE to copy 95-TP-102.

- Section 3.5: Loss of Prime Mover -- D. Finney reported that this information was not included in the original tutorial and the information was compiled from C37.102, including sequential tripping, for the new section. The section is at five pages and they would like to add an example. It was recommended that sequential tripping be mentioned in this section but the detailed explanation be included in Section 5.1.

A general discussion was had on providing specific setting calculations in the tutorial. There was general consensus that the tutorial will get too large if calculations were provided for every setting. It was suggested that the front of the tutorial refer to C37.102, which includes detailed setting calculations.

- Section 3.6: Out-of-Step Protection (J. Gers) – J. Gers reported that the original material was used as a basis for the new section with a few additions. The section could be shortened and believes that once the section is put into a two column format the size will be reduced. It was discussed that the main goal of the tutorial is to provide an understanding of the physical properties of the machine and to provide considerations that should be taken when doing the settings. It was discussed that an example should be given that maybe showed a case where the 120 degree stability and associated time delay were not adequate. C. Mozina and J. Gers will coordinate the material between section 3.6 and section 1. M. Yalla and C. Mozina will provide a peer review for the section.

It was discussed that both the loss of field and the backup distance sections should also include a discussion on stability and how these functions are impacted by both stable an unstable power swings.

- Section 3.7: Voltage Transformer Signal Loss – C. Ruckman reported that work has not yet begun. A draft should be ready by the next meeting.
- Section 4.1: Inadvertent Energizing – C. Mozina indicated that some of the schemes shown in the original tutorial are rarely used in the industry. The schemes detailed in C37.102 will be incorporated.
- Section 4.2: Special Operating Modes – P. Kerrigan and J. Uchiyama volunteered to revise the section.
- Section 5.1: Tripping Modes (S. Kim, K. Stephan) – K. Stephan noted that the original tutorial was not very comprehensive in this area. The table and general philosophy should be updated based on the latest in C37.102.
- Section 5.2: Multifunction Generator Protection Systems – M. Yalla reported that that this new section is ready for peer review. D. Finney will perform the peer review.

Chair noted that anyone is welcome to perform a review of any of the section. Because this tutorial will not be balloted, it is important that the WG is thorough in its methods and that someone is responsible for a detailed peer review on each section.

Chair requested that writing assignments be submitted for distribution by April 28, 2008.

Chair asked for discussion on the template that was forwarded to the WG. Chair will ask the IEEE about the format requirement for tutorials. It was consensus that the proposed format will be used for

the tutorial unless otherwise prescribed by IEEE. It was strongly urged by the chair to make sure that formatting (paragraph symbol button) is turned on when modifying the document.

J9: Motor Bus Transfer

Chair: Jon Gardell

Vice Chair: Dale Fredrickson

Established: 2006

Output: Transactions paper or report

Expected Completion: TBD

Status: Outline

Sixth Meeting, 1/9/2008; Double session:

1. Introductions, 15 members, 6 guests
2. WG approved the September meeting minutes.
3. John Boyle made a presentation of test results for motor bus transfers conducted at a generating station. Tests were done using residual voltage (30%) and sequential transfers. Results were instructive for comparing the motor current inrush and voltages in the different cases. The WG noted the need to be aware that relay functions may inadvertently trip during a bus transfer, specifically motor instantaneous overcurrent and transformer differential. Settings of '50' elements on motors may need to be 2.5 to 3 times the motor locked rotor current to avoid undesirable operations. Settings on undervoltage relays should also be reviewed to avoid unintended operation during a transfer. John's presentation should be made available to WG members pending further discussion with the chairman on the need for further explanatory content and making the facilities more generic.
4. Discussed a proposal by Russ Patterson to conduct bus transfer testing at one of his facilities. Though Russ was not available to attend this meeting to provide details, the WG felt this would be extremely valuable and should be pursued even though some extra time will be needed.
5. The group discussed the need for high speed synch check relays to supervise a bus transfer, especially to block a transfer under high angle difference conditions. There are limitations on the response of electromechanical relays for this function. An assignment to test synch check relay response of modern and legacy relays for suitability in bus transfer applications was taken by Tom Beckwith and Dale Finney.
6. WG discussed the effects of variable speed drives and synchronous motors on bus transfers.
7. Other outstanding writing assignments will be clarified by the chairman.
8. WG J9 requests a room, with computer projector, for 25 for a double session during the September meeting.

By: Dale Fredrickson

J10: Guide for AC Motor Protection

Chair: Prem Kumar

Vice Chair: Dale Finney

Established: 2007

Output: Guide Revision

Expected Completion:

Status: Outline

The meeting was attended with 10 members and 4 guests. After the introductions, the Patent Slides were shown.

The Charlotte meeting minutes which was circulated was approved with quorum.

Chair informed the WG that the WORD and figures document of final C37-96-2000 was obtained from IEEE and they had been integrated as one document. It was being checked for accuracy.

Assignments were assigned to various tasks as indicated below

- 1) Information on failure mechanisms for motors-Jon Gardell and Sudhir Thakur. They would summarize data from gold book, IEEE 352 . The intent of failure data is to emphasis the reasons for having specific protections.
- 2) Understanding motor data sheet interpretation and translation into motor relay settings such as motor cooling time constants and motor running time constants [cooling time constant vs. cooling time, running vs. stopped cooling time, starts per hour, empirical determination of cooling time, relay determination of cooling time. - Prem Kumar and Dale Frederickson]
- 3) Relevant tutorial type material that helps with derivation of relay settings such as explanation of motor speed-torque curves [voltage vs. torque with regard to starting requirements, breakdown/pull up torque]-Mike Reichard, Jon Gardell & Wayne Hartmann
- 4) Inclusion of setting examples using protection elements similar to the annex of C37.102-2006. Enhance 21 element section of the present guide-This would be assigned later
- 5) Coordination/application considerations for fuses over relay such as used with fused contactor applications [instantaneous considerations, phase fault clearing limitations] (Larry/Tom Farr)
- 6) Considerations for settings derivations for reduced voltage starting (Tom Farr)
- 7) Placement considerations of power factor correction capacitors relative to motor relay sensing CTs(Tom Farr)
- 8) Summarize ASD powered motor protection considerations from Rotating Machinery Subcommittee paper effort (J1 Report)-Later-J1 to develop a summary be included in Guide
- 9) Motor bus transfer protection considerations from Rotating Machinery Subcommittee paper effort (J9 Report)-Later
- 10) Elaborate reasons for delay on ground fault protection using toroidal CT [capacitance from cables, motor inrush phase current differences, surge caps]-Chris Ruckman
- 11) Add information on how to apply surge capacitors (protection). There is material available for review from last C37.96 effort. Check if any other guides exist to address the subject in addition to C62. We should write then have reviewed by liaison.-Sudhir Thakur
- 12) Considerations for application low ratio CTs, high ratio retrofit Prem Kumar/Dale Finney
- 13) Use of dedicated BF on small motors to ensure clearing Prem Kumar/Dale Finney
- 14) Explanations of insulation class and setting relevance. Bearing temperature also-Joe Uchiyama.
- 15) Add information from Buff Book that contains useful NEMA MG-1 content (design types, insulation class, etc.). Need to review to see if permission is required to use this data-Joe Uchiyama.

JTF3: NERC Generator Protection Response

Chair: Joe Uchiyama

Vice Chair:

Established: 2007

Output: Special Report

Expected Completion: TBD

Status: Outline

JTF3 met with 18 people on 1/8/2008. The chair opened the meeting with the present assignment. The review of protective functions is based on the blackout incident of August 2003, NEPP area. The

recommendations of this effort will be submitted to NERC SPCTF. The following issues were brought up by the attendees:

1. What is the definition of “generator backup” relay?
2. System backup versus generator backup
3. The NERC data provided (tripped units, elements initiated to trip, etc.) is not adequate to discuss the trips (correct operations or incorrect ones).
4. Include checklists for verifying the relay settings/meeting the standards.

The updated draft document will be sent to attendees.

In subcommittee, Bob Cummings and Tom Wiedman attended to discuss this work. Out of the 2003 blackout, many generating units tripped. When asked what tripped the units, many owners did not know. NERC is no longer accepting no reason for the trip. The NERC group that Joe Uchiyama is serving on is charged with developing papers, tutorials, whatever could help the industry better understand what protective functions trip their generators and why. This includes understanding relay targets and settings. NERC is also soliciting expertise in generator and steam control systems.

Wayne Hartmann proposed a simplified checklist for owners to help them review their settings and point to more detailed references, including IEEE documents. This concept was well-accepted by Bob Cummings of NERC.

Phil Winston explained that the existing NERC PRC-001 is aimed at requiring system owners to coordinate and prove they have coordinated. It includes what protective functions need to be considered for coordination. It does not address the settings themselves.

Liaison Reports
Electric Machinery Committee

C.J. Mozina

The EMC met at the PES General Meeting in Tampa in June of 2007. This committee is divided into three subcommittees: Generators, Motors and Materials. The work of the Generator and Motors Subcommittees are of interest to the PSRC.

- **Generator Subcommittee** – The subcommittee created a WG to working on harmonization of C50.12 and 13 with IEC 60034.
- **Motors Subcommittee** – Most of their meeting was spent organizing there paper session for the next PES General Meeting. Standard 620 – Guide for the Presentation of Thermal Limit Curves for Squirrel Cage Induction Motors is due to be updated and they are look for a chairman.

IAS I&CP Committee

C.J. Mozina

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

Nuclear 1E WG
No activity report

P. Kumar

NERC

J. Uchiyama

Finished up the report on maintenance testing interval impact on generator protection equipment.

Continued work on NERC reporting requirements for greater than 2000 MW

The Standard Drafting Team for PRC-001 Proposed to change from Coordination of Transmission and Generation Protection to Protection Coordination of Transmission and Generation Systems. The intent is to remove the operational issues from PRC-001 and focus only on the protection coordination. Phil Waudby and Phil Winston are part of the working group on this.

Coordination Reports

None

Old Business

J5 paper will be given at EPRI workshop in two weeks as well as the upcoming IEEE Pulp and Paper (PPIC) conference.

New Business

C37.106 needs to be circulated for reaffirmation. This will be started by the Subcommittee Chair and Vice Chair.

Phil Waudby is working with Phil Winston on PRC-001. Phil asked the subcommittee for confirmation of the IEEE protective function numbers. The list determined is as follows:

21, 51V, 81 O/U, 78, 40, 27, 46, 24 (if Transmission Owner owns GSU), 51N (GSU), 51 (GSU thermal), 50/27, MEL/URAL (planners need to know and this may be more of a planning group effort)
50/62 BF

K: SUBSTATION PROTECTION SUBCOMMITTEE

Chair: F. P. Plumptre

Vice Chair: P.G. Mysore

The K-Subcommittee met on Wednesday January 9, 2008, in San Antonio, TX with 16 members and 19 guests in attendance. The minutes of the September 2007 meeting in Charlotte, NC was approved.

ITEMS OF INTEREST FROM THE ADVISORY COMMITTEE MEETING:

PSRC will be involved with Industry Applications Society (IAS) to revise IEEE color book series. The revision is expected to be completed by 2010.

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

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, on Wednesday, January 9, 2008. Three members and five guests were present.

Pratap Mysore, vice-chair, chaired the session in the absence of the Chair, Dr. Mohindar Sachdev.

The recirculation of the guide passed with 100% approval. The editorial board has reviewed the document and is formal approval is at the January NESCOM meeting.

The work on IEEE summary paper is progressing.

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: May 2008

Draft 10

Working Group K3 met 01/09/08 with 7 members and 6 guests.

The Agenda followed was:

1. Call to order and introductions
2. Minutes from previous meeting was reviewed.
3. Draft 10 was reviewed and slight changes made in title by changing subject from outages to outage durations, and making it rev 11 (**Reducing Outages through Improved Protection and Autorestitution in Distribution Substations- -> Reducing Outage Duration through Improved Protection and Autorestitution in Distribution Substations**)
4. Assignments that had been put on hold will now be completed-
 - a. Frank Plumtre to revise figure 5 in document. Once completed, full paper to be submitted to subcommittee as working group report to be posted on K website. This is expected to be submitted at May meeting.
 - b. Tarlochan's new schedule to have Transactions paper ready before May meeting. Will be emailed to working group for review as soon as available.

Full paper to be a Report to the PSRC Subcommittee & summary paper to be a submission to Transactions.

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 1.0

Working Group K5 met with 13 members and 6 guests.

The working group met in a single session on Tuesday, January 8, 2008 in San Antonio, TX.

Bruce Mackie's writing contribution for the paper on Event and Fault Recording was discussed. It was decided that additional material on this topic would be added, including material on cross-triggering and automatic archiving. Joao Afonso, Larry Henriksen, and Frank Plumtre will contribute material for Bruce to add for the next revision.

Roger Whittaker's addition to clause C of the paper on distributed lockout functions was discussed. The discussion was an introduction to Kevin Donahoe's presentation on "The Application of IEC® 61850 to Replace Auxiliary Devices Including Lockout Relays" which was part of a larger presentation given at Georgia Tech Relay Conference. Roger and Kevin will collaborate on some addition material on the subject, which will include issues about reduced wiring, maintenance, and usage of bi-stable outputs.

Bogdan Kasztenny reviewed and modified clause 3.4 Automatic Reclosing. Copies of his reviewed clause were distributed to the working group but time did not permit a discussion.

K6: Sudden Pressure Protection for Transformers

Chair: Randy Crellin

Vice Chair: Bill Gordon

Established: May 2005

Output: Report

Expected Completion Date: May 2009

Draft 1.0

The working group met on Wednesday morning, January 9, 2008 for the seventh time in a single session with 10 members and 5 guests. The working group currently has 20 members.

Randy Crellin welcomed everyone to the meeting and then started the meeting off with a discussion of the sudden pressure survey. The working group decided that the survey would be conducted via the PSRC website.

The working group then discussed the presented survey questions. After an overall review of the questions, the questions were subdivided in categories. Assignments were made to edit/arrange the questions in each category. The assignments are as follows:

- Maintenance and Test – Frank Plumptre
- Turn to Turn – Don Lukach
- Misoperations – Jim Platt
- Use/Performance – Charlie Sufana
- Logic/Schemes – Gene Henneberg

Writing assignments are due by January 25, 2008.

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 this session. A draft summary paper was reviewed at the September 2007 working group meeting but has not yet been finalized. Last subcommittee meeting (Charlotte) it was approved to submit the summary paper as a subcommittee report.

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 0

The K8 working group met on January 8, 2008 in one session with seven members and eighteen guests in attendance. After the introductions, Slides on IEEE-SA "Bylaws on Patents in standards" were shown.

CDs containing the materials needed for the working group activity and the comments received from reviewers during reaffirmation, were distributed to the attendees.

Pratap Mysore, the Chair, thanked IEEE std. 18 revision working group members of the Capacitor Subcommittee, for deciding join the K8 working group meeting.

Jeff Nelson, the Chair of the Capacitor subcommittee mentioned that NEMA CP1 would be rolled into IEEE 18. He also updated the group on the activities of the switchgear committee. The effects of capacitor banks and the associated current limiting reactor on circuit breakers is being covered in the switchgear committee.

The issue is using reactors to limit capacitor bank contribution to fault causes probable circuit breaker failures due to high TRV. (See C37.011). There was a concern on covering topics in C37.99 that is already covered in other guides and standards developed by the capacitor subcommittee. Draft copies of the guide will be sent to Jeff Nelson/ Mark Mcvey who will coordinate the input from capacitor subcommittee.

Draft 0 of the guide, put together from the documents received from IEEE, was discussed. Pratap Mentioned that only one review assignment has been completed - Clause 7 review was received from Alla Deronja.

Following clauses were reviewed:

Clauses 1 - (overview and Purpose)

Clause 2 (references) - Jeff Nelson mentioned that an addendum- A (C37.04A) may need to be included as reference.

Clause 3 (definitions) - Definitions of parallel (element) connected and series (element) connected were revised. All other definitions were updated to match definitions in other IEEE documents.

Russ Patterson will provide a write up on the bridge configuration of capacitor banks.

Jeff Nelson mentioned that the discussion on unfused banks has been removed from other documents relating to shunt capacitor bank applications. Pratap will contact John Harder to discuss whether discussions pertaining to unfused banks should be removed from the C37.99 document.

Other discussions: Pratap mentioned that a failure of 345-kV/115 kV transformer at Xcel Energy was attributed to frequent switching of 1 80 MVAR capacitor bank on the weak 115 kV system. The general opinion was that this may not be the cause.

New topics that will be added to the guide are clauses on modern protection methods and on setting examples.

Vittal Rebbapragada, David Zinn, Demetrios Tziouvaras joined the working group as new members. Jeff Nelson joined the group as a corresponding member.

New writing assignments were made and assignment sheet will be e-mailed to members with the meeting minutes. **All assignments are due by Feb 28, 2008.**

Roger Hedding documented meeting minutes.

K9: Protection Considerations to Mitigate Arc Flash Hazards

Chair: Karl Zimmerman

Vice Chair: Roger Hedding

Established: 2005

Output: Technical report to subcommittee

Expected Completion Date: 2008

Draft 4.0

The working group met on January 8, 2008 with 12 members and 11 guests. The latest draft (Draft 4), updated to IEEE format, was distributed to the attendees and for the majority of the meeting we reviewed Table I, the summary of all the protective relaying solutions to mitigate arc flash. A discussion ensued on the usefulness of the document. The WG agrees that the paper is useful.

Several changes to the document were suggested:

- Introduction: Reference clause in NESC that this document does not deal with any specific safety issues, covered by other standards and regulating organizations.
- Section IV: Add a description and clarification of zones of protection, what faults are cleared based on fault location, and the importance of tripping all source breakers. (KZ)
- Section 4.3: Add short description of bus differential protection. (RH)
- Section 6: Revise section 6 to harmonize with Section IV, include mention of reclosing practice (Block reclosing) and overhead considerations. (John Miller)
- Wording in Section 4.5 to clarify current sensing supervision of light detection method.

Assignments are due by the end of January, document to be revised and distributed to all members and guests by mid-February. The goal is to have a WG Consensus Ballot at the May meeting, so paper can be sent to the Subcommittee.

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 Jan 8, 2008 with 4-members and 6-guests. I let everyone know that the next 1547.x meeting will be in Atlanta the first week of Feb. Also, I sent an email in December 07 notifying the membership of "ballot group" formation for P1547.2 "Draft Application Guide for IEEE Standard 1547, Interconnecting Distributed Resources with Electric Power Systems". If you are interested, the ballot group is still open. 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 Systems Distribution Secondary Networks". These two groups will meet in Atlanta.

P1547.3 "Draft Guide For Monitoring, Information Exchange, and Control of Distributed Resources Interconnected with Electric Power Systems" was approved by the standards board in late May and published in November 07. It is available for purchase at the IEEE bookstore web site.

P1547.4 is at Draft 3 and is available on the SCC21 web site.

P1547.6 moved to draft 1.1 but there is still much controversy about adding DG to spot networks. Charlie Sufana pointed out that network protectors are not designed for fault interrupt duty which is a requirement if DG is added. Network guide was reaffirmed and I am providing a copy to the chair of .6.

IEEE1547-2003 comes up for reaffirmation this year so get your comments ready. I will send out a reminder when process begins.

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.

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

Chair: Frank Plumtre

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 met in a single session on Tuesday, January 8 with 5 members and 8 guests in attendance.

The working group agreed to produce a transaction paper as a summary paper for the Guide. The goal is to present the transaction paper at the IEEE PSCE March 2009 meeting in Seattle, Washington.

The assignments for writing the clauses for the transaction paper are:

- | | | |
|----|---------------------------------|------------------|
| 1. | Preliminary Considerations | Gustavo Brunello |
| 2. | Protective Functions | Dean Miller |
| 3. | Platform Power & Signal Trans. | Frank Plumtre |
| 4. | Control & Monitoring | Simon Chano |
| 5. | Additional Prot. Considerations | Mukesh Nagpal |
| 6. | Testing | Vahid Madani |
| 7. | Annexes | Frank Plumtre |

All writing assignments are due to Frank by January 29.

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 6.03

The K14 Working Group met on January 9, 2008 in two sessions. Attendance in the first session was 18M and 24G, while there were 13M and 14G in the second session. Vice Chairman Stephen Conrad ran the first session, Chairman Bogdan Kasztenny the second. The minutes of the September (Charlotte, NC) 2007 meeting were approved as printed.

Bogdan Kasztenny opened the meeting with introductions followed by the explanation of the IEEE Patent notification. He then reviewed the status of the guide and passed out copies of Draft 6.03, then excused himself due to conflicting meeting.

Draft 6.03 of the Guide now contains the desired major topic material to cover bus protection. Outstanding writing assignments are needed to complete the updating. Several teleconferences were held between the September meeting and the January meeting to clarify 35 pages (30%) of the draft. These were conducted during 1 hour teleconferences and proved to be very successful. A list of "definitions were displayed from the I2 Terminology WG for review by the WG. These are to be sent to the attendees for comments prior to the next meeting.

Sam Sambasivan presented to the WG a discussion on Annex D dealing with CT location. He plans to introduce the Annex material with a discussion in Clause 5.1.

The second session focused on the need to rewrite material dealing with several issues identified when reviewing the structure of the document.

- a. Relay input sources / current transformers / CT classification (6.1) – Gustavo Brunello and Juergen Holbach
- b. Differential OC methods (7.1) – Hyder DoCarmo
- c. Blind zones / sequential tripping / end fault protection (8.4); aligned with Annex D – Pratap Mysore
- d. BF considerations (8.8) - Roger Whittaker (as related to backup)
- e. Backup considerations (8.9) – Roger Whittaker
- f. Stub bus considerations (new) – John Miller
- g. CT column ground fault protection (new) – Bruce Picket

Liaison Reports:

Nothing to report

Old Business:

Nothing to report

New Business:

Two task force groups were formed to review reaffirmed standards.

KTF2: C37.108 - IEEE Guide for the Protection of Network Transformers. Charlie Sufana will be the chair of the task force.

KTF4: C37.95 – IEEE Guide for Protective Relaying of Utility-Consumer Interconnections Mukesh Nagpal will be chair of the task force.

Gustavo Brunello, George Moskos and Mukesh Nagpal are the new members of the K 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 four interesting presentations.

- Guide for the Application of Rogowski Coils used for Protective Relaying Purposes Ljubomir Kojovic
- Cybersecurity Issues for Relaying Solveig Ward
- Revision of C37.90, Standard for Relays and Relay Systems Mario Ranieri
- IAS Color Book ReEngineering Project Cary Cook

Future Meetings:

May 12-14, 2008	Kansas City, MO
September 7-11, 2008	Burnaby, B. C., Canada
January, 2009	Joint PES Meeting, Location TBD
May 10-14, 2009 –	Pittsburgh, PA

VIII. The meeting was adjourned by Chairman Charlie Henville.