



POWER SYSTEM RELAYING COMMITTEE

OF THE

IEEE POWER ENGINEERING SOCIETY

MINUTES OF THE MEETING

Sept. 18 – 21, 2006

Atlanta, GA

Final

**Power System Relaying Committee
Main Committee Meeting Agenda
Sept. 21, 2006
Atlanta, GA
8:00 AM– 12:00 NOON**

- I. Call to order / Introductions Phil Winston**
- II. Approval of Minutes/Financial Report Miriam Sanders**
- III. Reports of Interest Phil Winston**
 - A Technical Paper Coordinator’s Report/Future Meetings Charlie Henville**
 - B PES Report- points of interest John McDonald**
 - C CIGRE Report T. W. Cease**
 - D UCA Report John Burger**
 - E EPRI Report**
 - F IEC Report Eric Udren**
 - G Standard Coordinator’s Report Jeff Gilbert**
 - H Substation Committee Report Mike Dood**
 - I Other Reports of Interest**
- IV. Awards/ Recognition Frank Plumptre**
- V. Subcommittee Reports Phil Winston**
 - K - Substation Protection Charlie Sufana**
 - H - Relaying Communications Alex Apostolov**
 - C - Systems Protection Tony Seegers**
 - D - Line Protection Roger Hedding**
 - J - Rotating Machinery Wayne Hartman**
 - I - Relaying Practices Jim Ingleson**
- VI. Presentations Miriam Sanders**
 - A Consideration for loss of AC voltage (WG D7) Elmo Price**
 - B C37.102 AC Generator Protection Guide (WG J4) Murty Yalla**
- VII. Adjourn Phil Winston**

Call to order / introductions Winston

Chairman Phil Winston called the meeting to order at 8:05 am.

Approval of Minutes – September meeting and misc.

Sanders

The minutes of the Albany May 2006 were approved. A brief financial summary was given. Our treasury is about \$15,000. Schweitzer Engineering Laboratory sponsored our Thursday morning coffee/food and we thank Ken Fodero for this.

Chairman's Report

Winston

Chair's Report September 2006

This being my last meeting as the Chairman of the PSRC requires me to look back over the last two years. Many great things have occurred because of the efforts of our members and the various folks that have volunteered their time and efforts. A few that come to mind are:

The increased interaction between the PES and the PSRC in presenting the works of this organization to the industry. Much of this credit goes to Rick Taylor and Charlie Henville

Six excellent meetings that have been arranged and coordinated by Miriam Sanders.

A Web Page that has been instrumental in keeping folks aware of our activities and the accomplishments of our members. All of the credit for this goes to Bill Lowe.

An active Awards and Recognition effort that has added several new 'opportunities' to recognize the contributions of our attendees. Frank Plumtre and Mal Swanson get pats on the back for this (even if Mal never did learn how to spell my name).

Most of all, I would like to thank my fellow Officers, SC and WG Chairs and Vice Chairs, and all our members and attendees that have helped to continue to make the PSRC the premiere technical committee in the PES.

Although I have truly enjoyed the opportunity to serve as an officer of the PSRC, I am looking forward to getting back into the workings of the WGs and SCs on a much more active basis.

Technical Paper Coordinator's Report

Henville

Technical paper activity

Activity since the last PSRC meeting included the following:

- The T&D exposition in Dallas Texas, in May, where the two PSRC sponsored panel sessions were successfully presented.
- The PES General meeting in Montreal, Quebec, in June, where three PSRC paper sessions, one poster session and one co-sponsored panel session were presented. The paper and panel sessions were well attended, with lively discussion. However the poster session continues to be less than desired in terms of participation by audience and presenters.

The next meeting with PES is the Power Systems Conference and Exposition on 29 October to 1 November, in Atlanta, Georgia. There will be two PSRC sponsored paper sessions with 11 papers. Miroslav Begovic and Damir Novosel will chair the two paper sessions.

There will also be two panel sessions at that conference.

- Upgrading and Retrofitting Utility Protective Relaying Systems - Chaired by Mark Carpenter
- Applications of Low Energy Analog Current and Voltage Transducers – Chaired by Eric Udren.

Thanks to those two individuals for taking the lead on these panel sessions.

Both the papers and the panel sessions at that conference promise to be interesting, useful, and practical. PSRC meeting participants are encouraged to attend and promote that conference. The website is <http://www.pscexpo.com/>

The next PES General Meeting will be in Tampa Florida in June 2007. The call for papers is presently open on the PES web site. Closing date for paper submission is 5th December. It is hoped that several PSRC prepared reports and publications will be presented at that meeting, possibly at sessions shared with other technical committees.

Future meetings

The January 2008 meeting will be held from 7-10 January 2008, at the Hyatt Regency, San Antonio, TX. This is the first ever meeting that will be at the same time as other technical committees of the PES and it is hoped that the co-location will enable participation by PSRC attendees at other technical committee session, and by other meeting attendees at PSRC sessions.

CIGRE Report

Cease

The 2006 General Session was held in Paris from August 27 to September 1, 2006. The preferential subjects for SC-B5 were:

PS 1. Impact of IEC61850 on Protection and Automation

PS 2. Protection Systems and Substation Automation for Major disturbances

The US had 2 paper accepted for the B5 session. Both papers address preferential subject 1.

There were 12 papers for the PS 1 session and 16 papers for the PS 2. A listing of those papers is attached. Anyone that needs copies of one of these papers please see me.

Study Committee B5 has a large number of open working groups and as a result chose not to start any new working groups at this time. There are several working groups waiting to start. They need members. Anyone interested in becoming a member either corresponding or regular please see me.

The working groups that most need members are:

1) New local Protection and Control approaches to minimize the impact of system disturbances, 2) Management of Protection Relay Settings, 3) Impact of Renewable Energy Sources & Distributed generation on S/S P&A, and 4) Protection, Control and Monitoring of Shunt Reactors.

There is also a task force on High Impedance Faults that could use members.

There are other opportunities available for anyone wishing to participate.

The 2007 Colloquium will be held in Madrid Spain October 15-20, 2007. The preferential subjects were discussed and the ones selected for now are:

PS 1 New trends in busbar protection

PS 2 Coordination of transmission system protection

PS 3 Acceptable functional integration in substation protection and control systems

As soon as everything is finalized I will send out the call for papers with the exact wording of the preferential subjects. It is expected that the due date for papers will be January 15 2007.

Attached is the scope and mission statement of SC B5.

Following is a listing of the Study Committies:

PS1 : Impact of IEC61850 on Protection and Automation

B5-101 IEC 61850: impact on substation automation products, architectures and projects - L. Hossenlopp (France), E. Guimond (Canada)

B5-102 IEC 61850: project experiences and future perspectives including IEC 61970/IEC 61968 harmonization - L. Hossenlopp, T. Coste, E. Lambert, A. Maizener (France), E. Guimond (Canada)

B5-103 Efficient migration to IEC 61850 by smart gateways - K.-J. Junglas, M. Schwan, H. Englert, N. Behr, J. Hogräfer (Germany)

B5-104 Implementation experience on IEC 61850-based substation automation systems - H. J. Herrmann, C. Hoga, G. Wong (Germany) W. Leitner (Austria)

B5-105 Fault tolerant technology to increase reliability for IEC 61850-based substation automation system - S.I.Lim, S.J.Lee, S.S.Han, D.W.Lee, W.J.Pan (Korea)

B5-106 Integra project – applying IEC 61850 technology - F. Matos, R. Cartaxo, A. Meneses, R. Paulo, A. Carrapatoso (Portugal)

B5-107 Standard IEC 61850 opens possibility to develop new more efficient architectures of substation automation and protection systems - J. Curk, I. Sistemi (Slovenia)

B5-108 The University City SAS. First project within Iberdrola group using IEC 61850 for a complete substation. Final experiences and future expectations - E. De Las Heras, J. Torres Pozas, J. Amantegui, A.Cerezo, P. Cardona (Spain)

B5-109 Experience of EGL with IEC 61850 in the refurbishment of an important European 380kv substation - S. Läderach, W. Baass, K.-P. Brand (Suisse)

B5-110 Requirements of interoperable distributed functions and architectures in IEC 61850-based SA systems - K.-P. Brand, P. Rietmann, T. Maeda, W. Wimmer (Suisse)

B5-111 Testing of IEC 61850 sampled analog values based functions - L. Hossenlopp (France), E. Guimond (Canada)

B5-112 Optimal strategies for system-wide protection and control replacement programs - P. Myrda, E. A. Udren, D. Bates, D. Novosel (USA)

PS2 : Protection Systems and Substation Automation for Major disturbances

B5-201 Change of protection principle to avoid cascade tripping in a series-compensation, parallel line application - F. V. González (Argentina)

B5-202 minimizing risks of cascade tripping – a systemic analysis of component protection - R. Menezes de Moraes, R. Balbi Sollero, J. Miguel Ordacgi Fo (Brazil)

B5-203 special protection schemes in operation at Itaipu power plant - R. Jovita G. Corrêa da Silva, M. Pereira de Almeida, J. Benedito Mota Júnior, E. Bordin Filho, R. Almir de Oliveira, F. Vega Daher, J. Gregório Acha Navarro, A. Gonçalves Leite (Brazil)

B5-204 Power restoration practices – the Brazilian experience - P. Gomes, P. Gomes Antonio de Pádua Guarini (Brazil)

B5-205 Loss of synchronism detection, a strategic function in power system protection - R. Grondin, I. Kamwa, M. Dobrescu (Mrs), A. Heniche (Mrs), G. Trudel, M.Rousseau (Canada), B. Kirby, S. Richards (United Kingdom), A. Apostolov (USA)

B5-206 Use of an integrated AC/DC special protection scheme at Manitoba Hydro Narinder - S. Dhaliwal, J. Brett Davies, David A. N. Jacobson (Canada), Rick Gonzalez (USA)

B5-207 Maintaining system integrity to prevent cascading blackout - Ding Zhong Meng (Hong Kong)

B5-208 Wide area voltage protection schemes - S. Corsi, G. Cappai, I. Valadè, M. Delfanti, M. Pozzi (Italy)

B5-209 Experiences and evolution of special protection systems in Japan - J. Tsukida, H. Kameda, T.Yoshizumil, T. Matsushima, Y.Kawasaki, M.Usui (Japan)

B5-210 Phasor measurements units (PMUs) applications in the transmission network of CFE Mexico - M. A. Silva Peruyero, C. G. Meléndez Román (Mexico)

B5-211 Coupling of networks with a new system for predicting dynamic balancing currents - J.M.A. Nuijten, M.J.M. van Riet, A. Geschiere (Netherlands)

B5-212 Defense plan against major disturbances in the Romanian power grid - A. Popescu, M. Cernat, M. Petran, S. Gal, F. Balasiu (Romania)

B5-213 Modern system protection schemes realization in large hydro power plant automation: local and system aspects - A. grobovoy, A.domyshev, A. osak, V. rodnikov, Y. vorobjev (Russia)

B5-214 Running fail-safe software and hardware tools for the instability prevention automation complex - D-r Gluskin I., D-r Dmitriev K., D-r Ivanov I., Kosolapov A., Rossovski E., D-r Landman A., D-r Petrov A., Petrov A., Popov G., Sakaev O (Russia)

B5-215 Evolution in the Spanish power system: new protection coordination criteria and critical clearing time calculation methodology - J. Ribot, S. López, F. Rodríguez, C. Martínez, C. Fernández, P. Lozano, S. Marín, J.L. Martínez, G. Molina, JM. Roca, B. Rodríguez, G. Nicolau, J. Vallina, J. Vaquero (Spain)

B5-216 Operational experience with wide area measurement systems - Walter Sattinger, Joachim Bertsch, Cédric Carnal (Switzerland)

CIGRE SC-B5 / Scope:

- Principles, design, application and management of power system protection, substation control, automation, monitoring and recording – including associated internal and external communications, substation metering systems and interfacing for remote control and monitoring

CIGRE SC-B5 / Mission:

- Promotion of continued development and exchange of experience for safer and more effective operation of power systems
- To be first international reference for power system protection and substation automation issues, synthesizing state-of-the-art practices and developing recommendations

CIGRE Study Committees

A1 Machines électriques tournantes/Rotating Electrical Machines

A2 Transformateurs/Transformers

A3 Equipement à haute tension/High Voltage Equipment

B1 Câbles isolés/Insulated Cables

B2 Lignes aériennes/Overhead Lines

B3 Postes/Substations

B4 CCHT et électronique de puissance/HVDC and Power Electronics

B5 Protection et automatisme/Protections and Automations

C1 Développement et économie des réseaux/System Development and Economics

C2 Conduite et exploitation des réseaux/System Control and Operation

C3 Réseaux et environnement/System Environmental Performance

C4 Performances techniques des réseaux/System Technical Performance

C5 Marché de l'électricité et régulation/Electricity Markets and Regulation

C6 Réseaux de distribution et production décentralisée/Distribution Systems and Dispersed Generation

D1 Matériaux et technologies émergentes/Materials and Emerging Technologies

PES Report

John McDonald

Though 2006 is far from over, I will discuss our accomplishments this year, changes in the PES Board for next year, and some plans for next year.

Review of 2006 Accomplishments

The accomplishments listed below would not have been possible without the hard work of the PES Board, as well as many other devoted PES members. I want to personally thank everyone who contributed to these accomplishments!

Education/Industry Relations Activities

- Formed new Subcommittee within the Power Engineering Education Committee (PEEC) to manage and maintain the Power System Basics course.
- In cooperation with IEEE, developed IEEE Expert Now on-line course titled "Cyber Security of Substation Control and Diagnostic Systems".
- Receive up to \$50,000 per year for 2006-2008 from the Grainger Foundation for PES conference student programs. These funds must be matched with PES and industry funds. Letters were sent to all Dallas T and D exhibitors requesting contributions to match the Grainger Foundation funds for supporting student programs.
- Formed Advisory Group on education/industry relations to discuss technical information and educational needs of the electric power industry and how PES can assist in meeting these needs.
- Held Industry Leader Focus Group Meetings in Montreal, Quebec, Canada and Atlanta, Georgia.
- Surveyed non-technical audience to determine educational needs and requirements, to assist in developing educational plan for this market segment.
- Surveyed PES membership to determine technical tutorial needs.

Meetings Activities

- Held April Executive Committee Meeting in Delhi, India – the first PES Board Meeting ever in India.
- Held successful T and D Conference and Exposition in Dallas in May, after hurricane Katrina forced cancellation of 2005 plans in New Orleans.
- In conjunction with seven other organizations (including three other IEEE Societies and IEEE-USA), held Wind Power Symposium in Washington, D.C.
- In dealing with the recovery from hurricane Katrina, moved T and D Conference and Exposition permanently to the first quarter time frame of the even years. For the first quarter time frame of the odd years, will hold the Power Systems Conference and Exposition (PSCE), which just completed a second effort in Atlanta, Georgia in October. With these changes, future PES General Meetings will be pushed into the mid-to-late July time frame beginning in 2008.
- PES has instituted the Joint Technical Committee Meetings to take place in the first quarter of each year. They will be held in Orlando, Florida in January 2007 and in San Antonio, Texas in January 2008.

Membership/Chapters Activities

- Held Region 9 Chapter Chairs Meeting in Panama City, Panama.
- Held Regions 1-7 Chapter Chairs Meeting in Montreal, Quebec, Canada.
- Held GOLD (Graduates of Last Decade) outreach event in Montreal, Quebec, Canada.
- Increased student membership through new initiatives.
- Conducted web site contest for PES chapters.
- Execution of different programs including: Outstanding Chapter Award, High Performing Chapter Program, Distinguished Lecturer Program, and Outstanding Chapter Engineer Award.

- Formation of several PES Student Chapters in university branches around the world.
- Formulated new chapters initiatives in Region 8 in Qatar and Bahrain.
- New chapter formed in Region 10 in Indonesia.
- Reactivating chapters in Region 9 in Brazil and Colombia.
- IEEE TAB Awards and Recognition Committee approved establishment of IEEE PES “IEEE Robert Noberini Distinguished Contributions to Power Engineering Professionalism Award”.

Technical Activities

- Formed Technical Committee Advisory Board (TCAB) to better represent Technical Committee views, needs and plans.
- Formed Wind Power Coordinating Committee.

Technical Information Services

- Launched IEEE Power & Energy Library and have multiple corporate sales to date.
- Recognized the top 2%, or 44 reviewers, of technical papers for the three Transactions and the Power Engineering Letters.
- Developed process to contact non-member authors to join PES.
- Formed ad hoc group to review the scope, title and other relevant issues of the PES Transactions.
- Reactivated PES E-newsletter with monthly updates and features.

Executive Office

- This was a year of family additions, personal and family injuries, and through all the hardships the staff juggled responsibilities seamlessly to get everything done.
- PES Constitution & Bylaws changes for:
 - New Division VII Director-Elect position
 - New requirements for number of signatures needed by petition candidates for PES Offices.

1. Long Range Planning

- Long range planning efforts emphasized focus in these areas:
 - Relevant, practical education for PES members and a broader set of stakeholders/constituents
 - Strategy to address future workforce
 - Boost image of power engineering in the eyes of industry leadership and society
 - Address emerging technologies in a way that accelerates their use in industry
 - Improve PES internal efficiency to better meet industry needs

Liaison with IAS

- Participated in IAS Board Meetings to strengthen relationship, bring IAS successes to PES, and plan joint activities.
- IAS President-Elect participated in PES Board Meetings.

New Board Members for 2007

- Paula Traynor, EPRI, will be the new VP, Technical Activities, taking over from Keith Gray, ABB.
- Mack Grady, University of Texas, will be the new History Committee Chair, taking over from Chanan Singh, Texas A&M University.
- Miroslav Begovic, Georgia Institute of Technology, will be the new Constitution & Bylaws Committee Chair, taking over from Osama Mohammed, Florida International University.

Plans for 2007

We discussed the PES goals for 2007 at the October Executive Committee Meeting on October 18. Here are some major plans for next year:

- Hold October Executive Committee Meeting in Beijing, China, in conjunction with the Region 10 Chapter Chairs Meeting.
- In cooperation with the American Education Institute (AEI), hold three jointly sponsored PES/AEI courses in January in Atlanta. Plan to hold these courses twice more in 2007 in different locations in the United States.
- Extend IEEE Xplore legacy base to cover the periods from 1952 to 1974 and 1978 to 1987 (1975-1977 were completed in 2006).
- Hold an IEEE Women in Engineering (WIE) event at the 2007 IEEE PES General Meeting in Tampa.
- Implement new membership contest for IEEE PES Chapters to increase PES membership.
- Hold Regions 1-7 Chapter Chairs Meeting in Tampa, Florida during General Meeting.
- Hold GOLD (Graduates of Last Decade) outreach event in Tampa, Florida during General Meeting.
- Hold Region 8 Chapter Chairs Meeting during PowerTech Conference in Lausanne, Switzerland.
- In cooperation with IEEE, and in conjunction with the IEEE Industry Applications Society (IAS), develop new IEEE Expert Now on-line course on Power Quality.
- Plan for a third joint IEEE PES/CIGRE Symposium in conjunction with the 2009 IEEE PES PSCE in Seattle.
- In conjunction with other IEEE Societies and Councils, plan Electric Ship Technologies Symposium (ESTS 2007) in Washington, D.C. in May 2007.

What Can You Do?

There are many opportunities for you to participate in the PES. We have activities for all interests and desires. Please contact me with any questions or comments. After my last President column in 2006 in IEEE Power & Energy magazine, I received a number of emails from PES members worldwide responding to my plea "We want to hear from you!" We are in the process of getting each one plugged into PES in areas of their interest. So, please send me an email to get involved in IEEE PES! I can be reached at j.d.mcdonald@ieee.org.

Respectfully Submitted,



John D. McDonald, P.E.

IEEE PES President
IEEE Fellow

EPRI Report

No written report at this meeting

IEC Report

IEC TC 95 Measuring Relays

- 60255-3 Dependent Time Relays (inverse time curve equations) – revision activity is alive! Broadening to two new standards:
 - ◊ 60255-127 under and overvoltage relays
 - ◊ 60255-151 under and overcurrent relays (note numbering!)
 - ◊ Maintenance team MT4 headed by Dr. Murty Yalla, USNC
- 60255-16 Impedance Relays – old and unrevised

Hughes

Udren

- ◇ 60255-121, Functional standard for distance protection
- ◇ Maintenance team MT4 headed by Dr. Murty Yalla, USNC
- 60255-6 Measuring Relays
 - ◇ Renamed 60255-1, Common Specifications
 - ◇ Purpose is the same as C37.90.0
 - ◇ Convenor Paul Millard, UK
- Revision plans for:
 - 60255-11 Interruptions to and alternating component (ripple) in dc auxiliary energizing quantity
 - 60255-22-1 - 1 MHz burst immunity tests [SWC]
 - 60255-22-2 - Electrostatic discharge tests
 - 60255-22-4 - Electrical fast transient/burst immunity test
 - 60255-22-5 - Surge immunity test [high-energy surge]
 - 60255-26 - Electromagnetic compatibility requirements [overview of other TC95 electrical environment standards]
- Corrigendum proposed by UK to Relay Safety Standard 60255-27
- Accessible parts, voltage application for routine tests, circuits for sample tests.
- Related to this, the PSRC officers have agreed to a plan by PSRC WG I4 to create new PSRC TFs or WGs to contribute to the development work of IEC WGs in new standard or standards revision projects during the writing rather than waiting to vote and comment on drafts after others have written them. This gives us more opportunity to influence the contents than we have had in the recent past. A key opportunity is to work through Dr. Murty Yalla, who is now the Convenor of IEC TC 95 MT4 that is developing the above listed Standards 60255-127, 151, and 121. We will try to establish a channel through the UK-based Convenor of the WG that will revise 60255-6 (now to be 60255-1).
- We express appreciation to Murty, whose efforts and contributions led to his appointment as the Convenor; and to Beckwith Electric Company that supports his attendance at meetings. Our most effective influence comes when US members participate in IEC development WGs, as can be seen in Murty's success. It has been tough in recent years to find US participants who can travel to meetings.

IEC TC 57 – Power Systems Management and Associated Information Exchange

- WG 10 is responsible for IEC 61850, Communication Networks and Systems in Substations. WG 10 is currently developing approaches for substation to control center and inter-substation messaging under 61850, going beyond the intrasubstation communications that are the focus of the original Standard.
- WG 10 is reviewing comments on the Committee Draft for 61850-7-4 Amendment 1 (Basic Communications Structure – Compatible Logical Node Classes and Data Classes – Power Quality Additions; Hydro applications). They are also reviewing comments on the Committee Draft for 61850-7-3 Amendment 1, Extension of common data classes for statistical and historical information.
- WG 10 and UCA UIG together manage TISSUES process to get unclear points and errors in the Standard fixed as they are found in 61850 implementations. All manufacturers and users are obliged to post problems and solutions in TISSUES process, so that IEC 61850 can keep its promise to be an open and interoperable protocol for all manufacturers and users.
- Related to WG 10 and IEC 61850:
 - UCA International Users' Group (IUG) held a session on IEC 61850 applications and projects at its meeting at CIGRÉ in Paris, 8/30/06. See papers at <http://sharepoint.ucausersgroup.org/>.
 - UCA IUG Testing Subcommittee is working on definition of station bus client device testing (substation host or concentrator, as opposed to relay which is called a server in 61850). Clients can have conformance tests and can receive certificates.

- This Testing SC is looking at how to define a conformance test on Process Bus (61850-9-2) equipment.

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 September 19, 2006, in the Atlanta C & D room of the Marriott Renaissance Atlanta Hotel

The status of selected PARs, Standards and Guides, were reviewed at the meeting. 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 May 2006 meeting of the PSRC, are identified as well.

Information concerning the Standards Association (SA), Board of Governors, Committees of SA, the Development of standards, Recommended Practices and Guides and related issues is available on the following web site.

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

Some of the other web sites for obtaining useful information are as follows.

Information on Web site address

Update your information with SA <http://standards.ieee.org/resources/development/>

myBallot Voter presentation <http://standards.ieee.org/db/balloting/myballotdemo.ppt>

myBallot Chair presentation <http://standards.ieee.org/db/balloting/myballotchairdemo.ppt>

PAR application, extension and other forms <http://www.standards.ieee.org/guides/par/>

Submitting a PAR <http://standards.ieee.org/guides/par/ePARform.html>

PAR Extension <http://standards.ieee.org/guides/par/extension.rtf>

Style manual <http://www.standards.ieee.org/guides/style/2000Style.pdf>

Template <http://www.standards.ieee.org/resources/spasystem/index.html>

Up-load drafts for balloting http://standards.ieee.org/eprocess/upload_balloting_file/

Request for invitation to ballot <http://standards.ieee.org/resources/development/>

Join a balloting pool Follow: [Balloting the Draft](#) → [Ballot Invitation](#) → [Requesting a Ballot Invitation](#)

Submit request for initiating balloting <http://standards.ieee.org/resources/development/>

Follow: [Balloting the Draft](#) → [Sponsor Ballot](#) → [Requesting Initiation of a Ballot](#)

Submit request for recirculation ballot <http://standards.ieee.org/resources/development/>

Follow: [Balloting the Draft](#) → [Sponsor Ballot](#) → [Requesting Initiation of a Ballot](#) → [Recirculation ballot](#)

Status of standards etc [Http://www.standards.ieee.org/db/status/status.txt](http://www.standards.ieee.org/db/status/status.txt)

NesCom activities <http://www.standards.ieee.org/board/nes/>

RevCom activities <http://www.standards.ieee.org/board/rev/>

SA Operations Manual <http://standards.ieee.org/sa/sa-om-toc.htm>

SA Bylaws <http://standards.ieee.org/guides/bylaws/index.htm>

SB Operations Manual <http://standards.ieee.org/guides/opman/index.html>

SB Bylaws <http://standards.ieee.org/guides/bylaws/index.html>

Important Information

All Standards developing groups are required to submit an L50-S form annually beginning in 2006. The report for 2006 is due March 2007; however, 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

PARs applied for by all Committees of the Power Engineering Society (PES) are circulated among the Standards Coordinators of the PES Committees. 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>

The following PARs approved by the IEEE-SA Standards Board may be of interest to PSRC attendees.

PC37.2 - Device Function Numbers

PC93.4 - Standard for Power-Line Carrier Line-Tuning Equipment (30-500kHz) Associated With Power Transmission Lines

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 May 2006 Meeting

The status of the standards activities, which have taken place since the May, 2006, meeting of the PSRC, are as follows.

1. Standards Published

- a. None

2. Standards waiting to be Published

- a. C37.99 IEEE Guide for the Protection of Shunt Capacitor Banks
- b. C37.101 IEEE Guide for Generator Ground Protection

3. Standards reaffirmed

- a. C37.99 IEEE Guide for the Protection of Shunt Capacitor Banks

4. Standards withdrawn

- a. None

5. Standards approved

- a. C37.101 IEEE Guide for Generator Ground Protection

6. Standards submitted for approval

- a. PC37.99 IEEE Guide for the Protection of Shunt Capacitor Banks
- b. C37.101 IEEE Guide for Generator Ground Protection
- c. PC37.102 Guide for AC Generator Protection
- d. PC57.13.1 Guide for Field Testing of Relaying Current Transformers

7. Standards to be submitted for approval

None

8. Submitted for Balloting/ Recirculation

- C37.90.3 IEEE Standard Electrostatic Discharge Tests for Protective Relays
- PC37.91 Guide for Protecting Power Transformers
- PC37.101 IEEE Guide for Generator Ground Protection
- PC37.102 Guide for AC Generator Protection
- PC37.109 Guide for the Protection of Shunt Reactors
- C37.112 IEEE Standard Inverse-Time Characteristic Equations for Overcurrent Relays
- PC37.116 Guide For Protective Relay Application To Transmission-Line Series Capacitor Banks
- PC37.117 Guide for the Application of Protective Relays Used for Abnormal Frequency Load Shedding and Restoration
- PC37.231 Recommended Practice for Microprocessor-based Protection Equipment Firmware Control
- PC37.232 Recommended Practice for Naming Time Sequence Data Files
- PC57.13.1 Guide for Field Testing of Relaying Current Transformers

9. Standards Balloted

- PC37.117 Guide for the Application of Protective Relays Used for Abnormal Frequency Load Shedding and Restoration
- PC37.231 Recommended Practice for Microprocessor-based Protection Equipment Firmware Control
- PC37.232 Recommended Practice for Naming Time Sequence Data Files

10. Standards Re-circulated

- PC37.99 IEEE Guide for the Protection of Shunt Capacitor Banks
- PC37.101 IEEE Guide for Generator Ground Protection
- PC37.116 Guide For Protective Relay Application To Transmission-Line Series Capacitor Banks
- PC57.13.1 Guide for Field Testing of Relaying Current Transformers

11. Standards to be Re-circulated

- PC37.105 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

- C37.90.3 IEEE Standard Electrostatic Discharge Tests for Protective Relays
- C37.96 IEEE Guide for AC Motor Protection
- C37.98 IEEE Standard Seismic Testing of Relays
- C37.99 IEEE Guide for the Protection of Shunt Capacitor Banks
- C37.101 IEEE Guide for Generator Ground Protection
- C37.102 IEEE Guide for AC Generator Protection
- C37.109 Guide for the Protection of Shunt Reactors
- C37.110 IEEE Guide for the Application of Current Transformers Used for Protective Relaying Purposes
- C37.112 IEEE Standard Inverse-Time Characteristic Equations for Overcurrent Relays
- C57.13.1 Guide for Field Testing of Relaying Current Transformers

The PARs approved since May, 2006, submitted, and the PARs for which extension has been applied are as follows. PARs, which will expire in 2006, are also listed. Applications for extending the lives of these PAR's must be submitted before the 16 October 2006 submittal deadline (for the December 2006 standards board meeting).

13. New PARs applied for

- P1706 Guide for Power System Protective Relay Applications over Digital Communication Channels

14. New PARs approved

- P1706 Guide for Power System Protective Relay Applications over Digital Communication Channels

15. PAR Extensions applied for

None

16. PAR Extensions approved

None

17. Modified PAR approved

- PC57.13.1 Guide for Field Testing of Relaying Current Transformers

18. Modified PAR Submitted

- PC57.13.1 Guide for Field Testing of Relaying Current Transformers

19. PARs Withdrawn

None

20. PARs expiring at the end of 2006

PC37.98	Standard Seismic Testing of Relays
PC37.101	Guide for Generator Ground Protection
PC37.102	Guide for AC Generator Protection
PC57.109	Guide for the Protection of Shunt Reactors
PC37.110	Guide for the Applications of Current Transformers Used for Protective Relaying Purposes
PC37.116	Guide For Protective Relay Application To Transmission-Line Series Capacitor Banks
PC37.117	Guide for the Application of Protective Relays Used for Abnormal Frequency Load Shedding and Restoration
PC37.230	Guide for Protective Relay Applications to Distribution Lines
PC37.231	Recommended Practice for Microprocessor-based Protection Equipment Firmware Control
PC57.13.1	Guide for Field Testing of Relaying Current Transformers

SUBMITTAL DEADLINES & STANDARDS BOARD MEETING SCHEDULE

PAR/Standard Submittal Deadline Standards Board Meeting

October 16, 2006 December 1, 2006

February 9, 2007 February 21, 2007

April 27, 2007 May 15, 2007

October 15, 2007 November 29, 2007

For further information download the report and spreadsheet from this site

or contact: Jeffrey G. Gilbert - PSRC Standards Coordinator at: jggilbert@ieee.org

Substation Committee Report Dood

B: ADVISORY COMMITTEE

Chair: P.B. Winston

Vice Chair: C. Henville

B1: Awards and Technical Paper Recognition

Chair: F. Plumptre

Vice Chair: T. Sidhu

1./ Mal Swanson handed out additional awards (these are the informal service awards) to be handed out at the main committee meeting.

2./ Mike McDonald is the new chair for Awards and Recognition

3./ Additional awards were discussed, including those suggested by PSRC officers. The specific suggested awards will be announced when they are formally handed out - hopefully at the January 2007 PSRC meeting.

B2: Fellows Awards

Chair: J.S. Thorp

B3: Membership Committee

Chair: M.J. Swanson

B4: O/P Manual & W.G. Training

Chair: J.C. Appleyard

No activity to report

B5: Bibliography and Publicity

Chair: T.S. Sidhu

Vice Chair: M. Nagpal

The working group met with six members in attendance. The 2005 bibliography paper has been accepted for publication in the IEEE Transactions on Power Delivery. Assignments for preparing the 2006 bibliography paper were made. Mal Swanson will coordinate with PSRC Chairman to prepare a report highlighting the recent activities of the PSRC. Al Darlington indicated that there is nothing to report as far as NERC DAWG reports are concerned. WG Chair will contact PSRC Webmaster to discuss possibility of having a searchable database of relay bibliography.

B8: Long Range Planning

Chair: Rick Taylor

B9: PSRC Web Site

Chair: Bill Lowe

Accomplishments:

- All pages relating to the September 2006 meeting have been updated.
- Added information links to the Agenda page for the Atlanta area.
- The pes-psrc mailing list subscriber data and web email addresses have been updated per information that has been provided to me.
- Solved a problem with return emails being sent to all list members.
- Sub-committee and WG web page problems corrected as problems are found or help requested.
- Repaired broken links due to web pages being hosted by different providers.

Future projects and items to explore:

- Continue to develop the "About PSRC" page. I will gladly welcome any ideas or text for the content for this page.
- New concepts for the main page will be explored. We have to find an easier way to get people to use our site. I think there should be a lot more information available on the main page. A test page will be developed.
- Update all necessary web pages relating to the January 2007 meeting.
- Update pes-psrc mailing list subscriber data and web email addresses.
- Find a method or software to tabulate the download activity on the PSRC web site.
- Add new web pages and links as the need arises.

Three members have shown interest in participating in the maintenance and development of the PSRC web pages. These are Jim Ingleson, Russel Patterson and Randy Crellin. A description of web duties will be prepared and the web work will be divided amongst the three of these people.

C: SYSTEM PROTECTION SUBCOMMITTEE

Chair: T. Seegers

Vice Chair: R. Hunt

The System Protection Subcommittee met on September 20th, 2006 in Atlanta, GA. 57 people attended the meeting, including 18 members.

9 WGs met at this meeting. The C Subcommittee minutes from the May 2006 meeting were approved by the members of the Subcommittee.

A former C Subcommittee Working Group, Protection Issues During System Restoration, won the Outstanding Working Group Award from the IEEE Power Engineering Society. Several members received their plaques at the PES General Meeting. Sungsoo Kim received his plaque during this meeting. Other working group members were recognized at the Main Committee meeting.

The Chair provided updates from the PSRC Advisory committee. The PSRC has opportunities for Working Groups to present at the upcoming PES General Meeting, in Tampa, June 2007. Also, the 2007 Texas A&M Relay Conference is looking for general tutorial ideas from the PSRC. Also, the Advisory Committee is starting a Working Group Chair training session at the January 2007 meeting, to be held once a year. 4 members from the C Working Groups plan to attend.

Shinichi Imai of Tokyo Electric Power Co. gave a presentation on a recent event in Tokyo on August 14th, 2006. The voltage instability protection scheme used by TEPCO worked correctly, and led to some interesting discussions.

WG Reports:

C1: Cyber Security Issues for Relaying

Chair: Solveig Ward

Vice Chair: Jim O'Brien

Output: Paper

Established: 2004

Expected Completion Date: 2007

The C1 working group met with 9 members and 17 guests in attendance. Two of the guests decided to become members.

A number of topics concerning Draft 1.11 of the paper were discussed. It was decided to move the section about NERC cyber security requirements to the Annex and some wording would be added to insure readers understood that the paper covered Distribution devices also.

A few other writing assignments were handed out to clarify sections of the paper.

Writing assignments are due to the Chair by October 15. A new draft will be sent to the members, guests and the C Subcommittee by the end of October for review with the intention of finalizing the paper at the January meeting.

Requirements for next meeting: 1 session, meeting room for 25 people, computer projector.

C3: Processes, Issues, Trends and Quality Control of Relay Settings

Chair: Steve Kunsman

Vice Chair: Gary Kobet

Output: Report

Established: 2003

Expected Completion Date: 2007

Working Group C3 met Tuesday, September 19, 2006 in Atlanta, GA in a single session with 10 members and 23 guests participating. Two guests have requested to become a member.

The report is now at Final Draft 6.0 after the working group session. A review and editorial phase will be completed by October 15th. Report will be submitted to WG and C-Subcommittee members for final vote by October 30th.

Timeline and milestones for completion

Review Minor editorials (Distribute for Vote) – Oct 15th, 2006

Vote Due from WG & C Subcommittee Members – Positive and Negative comment by October 30, 2006

Distribute to final version to Main Committee – November 30, 2006

January session will focus on the summary presentation for May Main Committee meeting. Gary Kobet, Eric Udren and Steve Kunsman will provide the base for the summary presentation.

Bryan Gwyn discussed CIGRE B5-31 working group “Life time management of relay settings” is producing a technical paper for SC 34 in colloquium 2010. They have received a version 5.2 as input for their work. The CIGRE group has proposed a joint meeting in Scottsdale with our next PSRC.

Actions:

1. Review and editorial by Frank Plumptre, Don Lukach, Hyder DoCarmo, Bryan Gwyn
2. Comments on Relay Access and Database by Stan Klein.
3. Review if a joint meeting in Scottsdale is possible by Tony Seegers.
4. Check as to PSRC members can be corresponding members to the CIGRE B5-31 by Bryan Gwyn.
5. Prepare abstract for regional conferences and possibly submit for Georgia Tech – Steve Kunsman

The WG requests that the latest draft (version 6.0) be posted to the PSRC website.

Requirements for next meeting: single-session, computer projector and room for 30 (10 addition if CIGRE members join) participants.

C4: Global Industry Experiences With Power System Protection Schemes (PSPS)

Chair: **Vahid Madani**

Vice Chair: Miroslav Begovic

Output: Survey

Established: 2004

Expected Completion Date: September 2007

WG C-11 met on September 19 in single session with total 26 in attendance (12 M, 13 G, 1 new member).

Brief overview of the coordination with CIGRE, the presentation announcements at the August / September 2006 CIGRE (SC B5 and SC C2), and additional communications planned through NERC as well as plans for the Western Protective Relay Conference (WPRC) and the IEEE PSCE were discussed. The two conferences are in mid and late October respectively.

The WG members reviewed:

- The final version of the HTML and commented
- Reviewed Contact List - “Assistance in completing the survey”
- Reviewed Procedures and who to send filled-out surveys
- Finalize methods for distributing the survey and follow-up reminders
- Survey will reside on unrestricted web site along with attachments and power point presentations used for communicating the Survey

Survey Broadcast and Dates:

- Release October 1
- Three follow-ups are planned
- Due date December 15

Announcement letter and a link will be provided on the PSRC web site under the “What’s New” selection button that will allow people to access the survey and supporting power point slides and survey Appendixes. A separate link will also be available under the PSRC C4 WG web site.

The members also reviewed the next steps including tabulation of responses, and agreed to form a smaller WG to help with tabulation of spreadsheet prepared by Stan Horowitz and input from the WG members.

Several of the WG members volunteered to be part of the smaller group charged with tabulation of results and also the comments within the responses.

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

C5: Deployment and use of Disturbance Recorders

Chair: Bill Strang

Vice Chair: Jeff Pond

Output: Report

Established: 2001

Expected Completion Date: January, 2007

The meeting was held at 4:30, Tuesday September 19 with 8 members and 8 guests in attendance.

Since the May session, three revisions to the document have been circulated and comments to two received and incorporated. Draft 12.7 was circulated for comments on August 13 with no further comments received. Since this draft included a number of revisions and additions, it was decided that this draft would be sent out for final review and consensus following our meeting, first to the members of the working group, then to the members of the subcommittee and the PSRC officers. A 10 day response will be requested for any comments for each of these recirculations. Following each of these circulations, any comments will be reviewed and incorporated as required to complete the document. A formal copy of the document will then be submitted to the PSRC officers for their approval.

During this interval between meetings, the WG Chairman met with the Subcommittee Chairman, Tony Seegers, to discuss his proposed changes to the document. These were incorporated into Draft 12.7 together with the revision to Section 10 from Rich Hunt. During that meeting it was agreed that a name change was necessary to remove reference to deployment of fault recorders as the document did not and does not contain this information. The new name for the document is "Considerations for Use Of Disturbance Recorders."

Rich Hunt discussed the comments and changes he had made to Draft 12.6. A majority of these regarded wording choices and format issues which were incorporated throughout the document. Rich also contributed a total revision to Section 10 Data Conditioning. Within this section, a discussion on triggering was added. There was a discussion on the selection of terminology. We will review comments received on this section in particular following this circulation.

A request was communicated to the Working Group from the Transient Recorder Users Council for a copy of the abstract of the document for consideration as a paper for their May 2007 meeting. This was approved by the Working Group and will be sent to them within the week. It was noted that a presentation of the working group's work to the main meeting of the PSRC would also be necessary. The target for this is the May, 2007 meeting.

It is expected that the January, 2007 meeting should conclude the work of this group.

Next meeting: We are requesting a single session meeting room for 25 and a computer projector.

C6: Relay Engineering in Power Engineering Curricula

Chair: Mani Venkata

Vice Chair: Jaime DeLaRee

Output: Transactions Paper

Established: 2003

Expected Completion Date: 2006

The meeting was called to order at 11:05 AM. Eleven members/guests were present. The Present Draft (09/19/2006) of the paper was distributed to members and guests for review and discussion. A motion to approve the paper was placed and was approved with minor changes. The paper will be submitted to the C Sub-Committee for approval.

The Present Draft (09/19/2006) of the WG Report was distributed to members and guests for review and discussion. A motion to approve the report was placed and was approved with minor changes. The report will be submitted to the C Sub-Committee for approval and publication in the PSRC website.

After the January 2007 meeting in Arizona the WG may be disbanded and a new task force may be requested to create educational modules following the instructions of this paper/report.

Next meeting: no meeting planned.

C9: Under Frequency Load Shedding and Restoration

Chair: **Alex Apostolov**

Vice Chair: Ken Behrendt

Output: IEEE Guide

Established: 1999

Expected Completion Date: 2007

The working group met on Tuesday, September 19th, with 6 members and 6 guests present. The results of the recent ballot for PC37.117 were discussed:

The ballot opened on 05/26/2006 and closed on 06/25/2006. The ballot met the 75% returned ballot requirement. There were 97 eligible people in this ballot group. 71 Affirmative votes; 2 Negative votes with comments, and 4 abstention votes

77 votes received

79 % returned

5 % abstention

APPROVAL RATE

The 75% affirmation requirement is being met.

73 votes = 97% affirmative

The two negative ballots were discussed. Some changes will be made in response to these negative ballots and the balloters will be contacted to report the changes. Other comments were also discussed, with appropriate changes and corrections made where necessary.

Next meeting: The working group expects to meet in single session at the next PSRC meeting, and needs a room for 30 with a projector screen and outlet strip.

C11: Guide for Protection System Testing

Chair: **Vahid Madani**

Vice Chair: Hyder DoCarmo

Output: Paper

Established: 2005

Expected Completion Date: September 2008

WG C-11 met on September 19 in single session with total 27 in attendance (12 M, 13 G, 2 new members).

The WG members reviewed a list of pending contributions. The following writing assignments were discussed:

- Sections on line differential protection testing and breaker failure scheme testing were discussed. Impacts of equipment switching (such as series or shunt reactors and capacitors), scheme security, channel impairments and methods for introducing bit error rate as part of scheme testing were discussed. Design of some of the latest line current differential products with dual communication channel and how to best test schemes under channel Primary / ht Standby, vs. Primary / Backup were reviewed.
- Breaker failure testing, examples of breaker failure applications are included as part of the scheme testing and associated interlock testing.

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

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: 2007

The working group met with 14 members and 22 guests present, chaired by Damir Novosel.

Damir reviewed the assignment of the working group which is to create a working group report and a summary IEEE paper that will describe performance of protective relays during wide-area stressed power system conditions. The work will not cover Special Protection Systems or Remedial Action Schemes. He reviewed the progress made to date in developing the working group report.

The current revision to the report is Draft 5. It is approximately 75% complete and comprises 77 pages. The need to condense the report was discussed. After considerable discussion, it was agreed to use any applicable material already contained in Section 3 on Protection-Related Behavior as the basis for Section 5 on Solutions. Individual assignments were made to review Section 3 and extract the appropriate paragraphs. It was also agreed to switch the order of Sections 4 and 5, placing the Field Experience and Examples section at the end of the report.

Additional writing assignments were made for all report sections that are missing or require major updating. These are due for submission to the working group chair and vice chair by December 1st. Draft 6 will then be created and e-mailed to the members before December 22nd. Working group members should be prepared to discuss the entire report at the January meeting in Phoenix.

The latest draft of the report is available on the working group web site.

Next meeting: single session, meeting room for 40 people with a computer projector.

C13: Undervoltage Load Shed

Chair: Art Buanno

Vice Chair: Imai Sinichi

Output: Report

Established: 2005

Expected Completion Date: 2008

The UVLS Working Group met at 9:30 AM on 9/20/06 for the fourth time with 36 in attendance. This included 13 members and 23 guests.

Patent slides approved by the IEEE-SA Standards board were reviewed.

The working group assignment and scope were reviewed with no changes.

The organization of the report was discussed but no changes were decided upon at this time.

Comments on the latest draft (1.3)

- Some concern was voiced about over-emphasizing topics not directly related to undervoltage load shedding. We decide that these topics still needed to be covered in the report but they will be reduced to an appropriate content level.
- The terminology of 'discontinuously controlled' should be changed to other words like discrete. The current terminology being used for static vars or switched capacitor banks will be investigated. The report will relate these common terms.
- In the section of UVLS philosophy, the relationship with planning engineers should be emphasized including the impact on the decision of scheme type and location of load shedding.

Discussion on open sections resulted in the following changes to writing assignments.

- Continuously controlled reactive power sources by Mozina
- SVC by Don Lukach

- STATCOM by IMAI
- Voltage reduction and LTC blocking; Begovic
- Manual load shedding; Rich Young
- Scheme Design; Remove Henville,
- 1989 HQ outage; Begovic
- Current UVLS position by NERC will be added in background by Tom Wiedman.
- Georgia Power's scheme will be introduced by Keith Harley.

The proposed timeline of activities for the working group assignment is presently the following:

November 15, 2006 – return of writing assignments

December 15, 2006 – January 7, 2007 – review Draft 2.0

January 8-12, 2007 – Next working group meeting

January – May, 2007 – Review & revise content & edit

June 30, 2007 – Complete editing

July-August 2007 – ballot paper

September 17-20, 2007 – Address negative comments

December, 2007 – Complete Report

A presentation was made by Miroslav Begovic on “Power system voltage stability and trends in protection” to the working group.

We decided to postpone John Burger's presentation to the next meeting due to time constraints.

Afterwards the meeting was adjourned.

Next meeting: We request a projector and a room for 40 people at the next meeting. At this time, we request a time allotment for a double session.

Power System Analysis, Computing & Economics Committee Liaison by Malcolm Swanson

No activities to report

NERC by Phil Winston

The PRC-002 and PRC-018 Standards for Disturbance Monitoring Equipment were approved by the NERC board, and are posted on the NERC site August 2nd, 2006. The proposed relay loadability standard is posted on the NERC site, with comments due by September 22, 2006. The “Zone 3 and Beyond Zone 3” standards are being turned into a standard. The System Protection and Control Task Force of NERC is working on technical requirements for 3 terminal lines. The PRC-001 Standard for coordination between generation and transmission relays is aimed at generating companies. This standard requires a procedure for communicating settings changes between all involved parties. Also, the NERC website now has a Technical Reference section.

Liaison Report of the IEEE PES Power System Stability Controls SC to the PSRC by Gary Michel

No activities to report

D: LINE PROTECTION SUBCOMMITTEE

Chair: R.A. Hedding

Vice Chair: M.J. McDonald

The Meeting was called to order by Chairman Roger Hedding at 4:30 p.m. on Wednesday September 20, 2006 in the Atlanta C&D meeting room. There were 27 members and 32 guests present

After introductions, the Minutes of the May 2006 meeting in Albany were Approved.

Advisory Committee items of interest:

With our existing Web Master Bill Lowe retiring, the PSRC is looking for someone to take over the Web Master duties.

Looking for working groups just finishing assignments for possible tutorials at Texas A & M.

Looking for potential papers from working groups to take part in super sessions at PES general meetings.

Working Group reports: (see attached document)

WG D7 has completed their paper on Loss of Potential Considerations on Line Protection and will be presenting this paper at the Main committee meeting on Thursday. Elmo Price's working group is congratulated on a job well done.

Liaison reports: TC57: Alex Apostolov had nothing to report.

New Business:

The results of the DTF22 response to the request of the NERC SPCTF to look at establishing a standard for relay under-frequency and undervoltage performance that had been chaired by Roger Hedding was presented. After considerable discussion as to what was being asked and what could be investigated a vote was taken to determine if we should pursue the issue. With a vote of 15 affirmative, 2 negative, a working group will be formed to investigate what can be done. A chairman to lead this effort has not yet been determined.

Chairman Hedding asked for support in filling out a CIGRE survey on High Impedance faults.

Alex Apostolov agreed to chair a TF (DTF21) to look into providing input to the IEC effort to create a Standard for Distance Relay Characteristics.

High Impedance Fault activity:

One report was made where a utility fatality occurred due to hand contact with a distribution feeder that was hanging low in dense downed tree limbs.

The meeting was adjourned at 5:45 pm.

D1: Cold Load Pickup Issues and Protection
Chair: Dean Miller
Vice Chair: Tony Sleva
Expected Completion Date: January 2007
Output: Special Report to the PSRC

Attendees: 11 members and 8 guests.

The working group met in a single session on Wednesday, September 20, 2006 in Atlanta, GA.

PSRC Working Group D1 is continuing to develop a special report that deals with Cold Load pickup issues and the impact of Cold Load on protective relay applications with the goal of submitting a special report to the Line Protection Subcommittee by September 2007.

At this meeting, Working Group D1, reviewed the current draft (Draft 2), reviewed writing assignments, and reassigned assignments of inactive members. Fred Friend presented a report that detailed a distribution line outage in May 2006. Fred's report illustrated a cold load phenomenon that begins within a few minutes of a circuit outage.

Working Group D1 is continuing to develop the special report and will meet in single session at the next PSRC meeting in Phoenix in January 2007. A meeting room with seating for 20 and a laptop compatible projector will be needed.

Prepared By: Tony Sleva

D4: Application of Overreaching Distance Relays

Chair: Russ Patterson
Vice Chair: Walter McCannon
Output: Report to the PSRC

Working Group D4 met with 16 members and 21 guests. Total in attendance was 37. Kenneth Opskar of Statnett, Norway's national electric power transmission system operator, gave a well received presentation on the use of overreaching distance relays in the Nordic countries.

The latest draft of the document was reviewed and productive edits made based on the consensus of the working group members present. It was decided to move the section of the paper on NERC issues to an appendix. Ratan Das submitted a short write-up to be placed in appendix pertaining to the effect of fault resistance and infeed.

Next meeting Requirements: Single meeting, 50 persons, computer projector.

D5: Guide for Protective Relay Applications to Distribution Lines

Chair: Phil Waudby
Vice Chair: Randy Crellin
Output: IEEE Guide PC37.230

Meeting summary for the Tuesday May 16, 2006 meeting held in Albany NY, submitted by Phil Waudby.

The working group met in a double session with 39 attendees (23 members and 16 guests).

We received over 300 comments from the initial balloting of Draft 4.0 of the document. These comments were reviewed by Phil Waudby, Ron Beazer, Ken Birt, and Randy Crellin prior to the meeting and approximately 40 issues were identified as requiring further discussion. During this double session meeting, we addressed about half of these issues and made revisions to the document.

We are currently planning on discussing the remaining issues at the September meeting and completing the necessary document revisions for re-balloting during October.

We will need to request a PAR extension in order to complete this document.

Draft 4.0, the spreadsheet of ballot comments received, and Draft 5.0 of the document are included on the PSRC D5 webpage. In an effort to expedite the document review process, everyone is encouraged to read this information and submit comments to Phil Waudby.

For the next meeting, we would like to request a double session, room for 40 people, and a computer projector.

D7: Loss of AC Voltage Considerations

Chair: Elmo Price
Vice Chair: Russ Patterson
Output: Report to the PSRC

Working Group D7 met for the final time. The chairman informed the WG paper would be presented at the Main Committee meeting on Thursday.

Next meeting requirements: none – work complete.

D8: Justifying Pilot Protection on Transmission Lines

Chair: Russ Patterson – effective Sept. 2006 meeting
Vice Chair: Bogdan Kasztenny – temporary Chair
Output: Report to the PSRC

The Working Group met in Atlanta on September 20, 2006 with 7 Members and 12 Guests. One guest offered to become a member of the WG, with total membership now totaling 28.

Gary Kobet, the original WG Chairman held the meeting. Special thanks to Bogdan Kasztenny for running the WG meetings in his absence.

Draft 1.41 of the report was distributed and reviewed. This was an update to draft 1.4 (posted to the PSRC website early September), which incorporated the latest contributions by Bill Kennedy in sections 3.2, 3.8, and 3.9.

All writing assignments have been received and incorporated, with the exceptions noted below:

- John Miller agreed to help Walter McCannon with section 3.6. Mike McDonald noted that the NERC SPCTF has recently produced a paper discussing the protection of multi-terminal lines which may be helpful in completing this section.
- Elmo Price agreed to review section 3. Marc Benou, Robert Bratton, and Hyder DoCarmo are asked to assist Elmo with this section.
- Mark Allen agreed to review sections 4 and 5. Jerry Finley, George Gresko, and Larry Henriksen are requested to assist Mark.
- Mike Jensen, Frank Plumptre, Solveig Ward, and Ray Young are requested to review sections 1 and 2.
- Gary Kobet will prepare conclusions for section 6.

Vahid Madani made comments on the 2nd bullet of the assignment, which states the document will discuss the criteria to determine how many pilot systems are needed in a given application, depending on several factors. Considering this aspect of the assignment, Vahid suggested that section 4 include discussion of voting versus vetoing schemes, the pro's/con's of line current differential (LCD) schemes on long transmission lines, and using dual pilot channels within LCD schemes. There was much discussion over making sure the document does not reach past the assignment.

Draft 1.41 will be posted to the PSRC website. Reviewers are asked to use this version, and to keep in mind the assignment.

WG members are asked to have their reviews and comments completed on their assigned sections by December 1.

Next meeting: single session, no computer projector, seating for 25.

Respectfully submitted by Gary Kobet, September 20, 2006

D9: Revision of C37.113 - Guide For Protective Relay Applications To Transmission Lines

Chair: Mohindar Sachdev

Vice-Chair: Simon Chano

Established: 2005

Output: Revision of IEEE C37.113-1999 (R2004)

Expected Completion Date: 2009

The Working Group D09, Revision of C37.113 - Guide for Protective Relay Applications to Transmission Lines, met in Atlanta A Room, Renaissance Atlanta Hotel, Atlanta, GA from 04:30 PM to 05:45 PM on Tuesday, September 19, 2006. Eighteen members and eight guests were present.

Mohindar reported that he had received five contributions since the May 2006 meeting of the WG. Another five contributions are outstanding. Draft 1 of the WG report was distributed before the meeting. This draft does not include the outstanding contribution as well as figures. New contributions will be added in the draft and the figures that are available will be incorporated. Draft 2 will then be distributed among the WG.

The issues raised during the reaffirmation of the guide were reviewed and actions needed were identified. Mike McDonald agreed to review the NERC recommendations and identify the issues that need to be addressed in the guide. He hopes to receive assistance from Pratap Mysore and Phil Winston in performing this task.

The issue of discussing the contributions clause by clause was then discussed. The Chair indicated that the report was too big for reading individual clauses in the WG meeting and discussing them for changes. He suggested that one third of the clauses, identified by the Chair as substantially complete, be reviewed by the WG members between two consecutive meetings and detailed comments provided to the Chair. The comments will then be discussed at the next WG meeting. The WG agreed with this procedure.

Silvia Moroni and Didier Wiot withdrew from the membership of the WG. Russ Patterson, Rick Taylor and Sudhir Thakur joined the WG.

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

Next meeting requirements: single session, seating for 40-50, computer projector.

D11: Effect of Distribution Automation on Relaying.

Chair: Fred Friend

Vice Chair: Gerald Johnson

Assignment: To prepare a special report to the PSRC that describes the effect of Distribution Automation on relaying.

The Working Group met at 8 am on Wednesday, September 20, 2006 with 9 members and 18 guests in attendance – one new member.

Presentations were made by Daniel Goodrich, SRP, and Don Parker, Alabama Power, describing some applications of Distribution Automation.

Additional presentations will be made at the January 2007 meeting in Phoenix. Volunteers were requested to make a presentation of their Distribution Automation experiences. Ideas for the report were also requested to be submitted.

Next Meeting: Single session, 35 people, computer projector.

(avoid conflict with D1 and D5).

DTF22 NERC SPCTF Letter Response

Chair: Roger Hedding

This task force met Tuesday with 13 people attending. After much discussion, the task force concluded that there in order to address the issues posed by the letter a working group should be formed, pending subcommittee approval. This working group would gather information on frequency limits and rate of change of frequency excursions for recoverable disturbances in a first step toward establishing parameters relay functions should meet. With this in mind, the assignment proposed for the working group is :

Investigate the feasibility of defining a range of frequency and rate of change of frequency to be used in a performance specification for protective relay functions.

A chairman is needed for this working group should it be approved.

Next meeting. 1 session, 30 people. Computer projector, chairman, vice chairman

H: RELAY COMMUNICATIONS SUBCOMMITTEE

Chair: A. P. Apostolov

Vice Chair: V. Skendzic

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

Chair: M. Benou

Vice-Chair: M. Allen

Output: Application Guide

Established: 2006

Working Group H1 for the first time since our PAR approval the previous week and the second time as a working group. We met on in a single session with 10 members and 10 guests.

Introductions were made and a quick review of the January meeting was made.

The working group's new working group name and title for the guide is, "Guide for Power System Protective Relay Applications over Digital Communication Channels." H1's new Scope is, "This document is a guide for the application of digital communication for protective relaying systems and schemes, including transmitting and receiving equipment, digital channels, application principals, performance, installation, troubleshooting, testing and maintenance. Reflected in this guide is the knowledge and experience of equipment manufacturers and power utility users. This guide is not intended supplant specific or general instructions contained in manufacturers' books or any contractual agreement." The new Purpose is, "The Primary Purpose of this document is to guide the power system user in applying, installing and operating digital communication channels for the purpose of protective relaying. The guide is prepared not only for those considering digital communication relaying for the first time, but as a reference for the experienced."

The effort of the working group was to start an outline for the guide. The topics to be included that were discussed in January were organized into an initial outline. The outline will be typed up and distributed to the working group for review and additional additions for the next meeting in January. The approved PAR will also be distributed.

H4: Revision of C37.111 (Comtrade standard)

Chair: R. Das

Vice-Chair: A. Makki

Output: Standard

Established: 2005

Expected Completion: 2008

The Working Group H4, met with fifteen members and eight guests. Four guests joined the working group. Minutes of the May 2006 meeting were approved.

Members requested to update the website where all the information including the demo program (which converts existing four files into one and restores four files from the one file) can be posted. Chair has taken the responsibility to update the website.

Draft 0 of the standard was discussed. Overview section was agreed. There were suggestions to have three types of files in the new standard: existing four files (with agreed modifications), one single file which is a collection of four existing files (with agreed modifications) and one single file with three sections related to CFG, INF and HDR in XML format while the data section will be in ASCII or binary.

Mark Adamiak will lead a group of volunteers to provide the XML schema by December 15, 2006 for discussion during the next meeting.

It has been agreed that the time description in the CFG file (section) will be in UTC, similar to that proposed in C37.232. Discussion was held on an assignment related to a new field for data synchronization in CFG file/section. Mark Adamiak will submit his written comment to the author of that section Pierre Martin within a week. Pierre will revise the assignment and submit to chair by October 15, 2006.

Chair will circulate Draft 1 to members/guests for written comments to be discussed during the next meeting.

H5: Common Format for IEDs

Chair: L. Smith

Vice-Chair: C. Brunner

Output: Recommended Practice

Established: 2003

Expected Completion: 2007

See reports for working groups H5-A, B, C below

H5-A: Common Format for IED Configuration Data

Chair: J. Holbach

Vice-Chair: D. P. Bui

Output: Recommended Practice

Established: 2003

Expected Completion: 2007

The group met with 11 members and 11 guests.

The working group discussed the assignment and came to the following wording:

“A common format and superset for protection settings should be defined. The data described in this common format should allow only one unique interpretation how they are used in a given application. The format and superset must be powerful enough to express any practical device configuration. The common format can be used to exchange setting data between different data source and receiver. Sources and receiver can be IED configuration programs, power systems analysis programs, data bases, setting coordination programs and automated test programs”

Based on the defined assignment the working group would like to change the title of the working group to “Common Format for Configuration data”

The group continued discussing how this superset can be found and described. As an example protection function the distance protection function was selected. After some detailed discussion about certain problems the group concluded, that a core group has to work out a first version of a possible superset for a distance protection function. The core group will be build by members of test equipment manufactures, relay manufactures and utilities. Alexander Apostolov volunteered to take the lead for this core group. The group will continue to work over the next 3 month and present a first version at the meeting in January 2007. The chair of this working group will send out invitations for a phone conference in the first week of October.

Stan Klein will submit a proposal, how graphical data (distance protection characteristics) can be described in XML format.

H5-B: Common Format for IED Event Data

Chair: M. Adamiak

Vice-Chair: P. Martin

Output: Recommended Practice

Established: 2003

Expected Completion: 2007

The WG met with 10 members and 10 guests in attendance. The first complete draft of the WG report, including a schema definition, was handed out to the attendees and discussed during the meeting. Specific discussion items included:

Need to include the NERC utility abbreviations in the document – Bob Cummings volunteered to provide the list and a web link to the list to the WG

It was noted that the abbreviation list only addressed North American utilities – a similar list will need to be developed for the rest of the world and it was discussed that perhaps this is a task that could be undertaken by the IEC TC57 WG 10 (the 61850 team)

The issue of revision tracking of the schema was discussed and Pierre Martin suggested adding a Revision field to the header of the file. This will be addressed in the next version of the document.

A URL for the Namespace of the document needs to be identified. It was proposed that the PSRC web page for reports (www.pes-psrc.org/reports) could be used. If the document migrates into the standards realm, it was suggested that the document number and the year of publication would then be an appropriate reference. This will be updated in the next revision.

The issue of the extensibility of the “PayLoad” data object was discussed quite extensively. Specifically, the source of the PayLoad data, its description, and the mapping into the schema were discussed. Additionally, it was noted that for this concept to work with the IEC61850 standard, extensions to a number of the object models will be needed. To move forward with this concept, it was decided to develop “use cases” of events and the associated PayLoads. The following individuals volunteered/were volunteered to create several “use cases” for the identified IEDs, namely:

Alex Apostolov – Areva

Scott Anderson – SEL

Ashish Kulshrestha – GE Multilin

Juergen Holbach – Siemens

Use-cases are due to the chairman by Dec 15, 2006.....

A discussion of the need for EntryTime in the format was held and deferred to it’s champions – Herb Falk and George Schimmel. A copy of these minutes will be sent to both of these gentlemen for comment

Finally, all members and guests are requested to read the draft document (labeled ver 3.2) and to offer comments accordingly. A copy will be submitted for posting on the web site (URL to be included in the minutes once posted).

H5-c: Common Data Format for IED Sampled Data

Chair: Benton Vandiver

Vice-Chair: B. McFetridge

Output: Recommended Practice

Established: 2003

Expected Completion: 2007

The working group met with 6 members and 9 guests present following sessions with H5-a and H5-b. The meeting minutes from the May meeting in Albany were reviewed and approved by the group.

Draft #4 of the report was reviewed and Amir Makki led an active discussion on the topic of sampled data definitions. The content and structure of the report was approved after section 5.3 was removed by agreement of the WG with the consideration of making a proposal for this topic to the H subcommittee to be addressed by a new WG.

It was recommended that a summary table be added to section 3 for an easier comparison of the sampled data types. It was also recognized that there are a few notes in the report covering some loose ends concerning the status and reference to other documents from the respective contributors to finalize those sections. These will be actively pursued in order to complete the report and move it to a final draft.

All updates will now be posted to the website, H subcommittee section for download. Further comments on the report are due by December 1st for inclusion in the final draft that will be distributed and reviewed prior to the January meeting. This report should be completed at the conclusion of the January meeting and the subcommittee notified of such. Report Status: Draft #4.

H6: Application of UCA (MMS/Ethernet) in Station LANSs for Protection and Control

Chair: J. Burger

Vice-Chair: C. Sufana

Output: Special Report

Established: 1999

Expected Completion: 2006

Group listened to the presentation about IEC 61850 and substation Ethernet given by Bogdan Kaszteny. Meeting was concluded with a lively discussion.

H7: Comparison of IEEE / IEC Teleprotection Standards

Chair: M. Simon

Vice-Chair: E. Fortin

Output: Report to H Subcommittee

Established: 2005

Expected Completion: 2008

H7 met with 14 members and guests. The group continued its compilation of IEC and IEEE standards related to teleprotection. Standards from organizations such as NEMA, FCC and the Telco's were discussed as potential gaps.

Writing assignments to collect abstracts for the standards to be compared will be completed prior to next meeting. A list of standards to be reviewed will be developed and the standards will be obtained for the group to begin its review.

H8 – PC37.232 Recommended Practice for Naming Time Sequence Data Files ComNames

Chair: A.Makki

Vice-Chair: Rick Cornelison

Output: Recommended Practice

Established: 2003

Expected Completion: 2007

The group met on time with 9 members and 1 guest present. The chair was pleased to report that a total of 68 people had joined the balloting group and that the votes were cast and that the recommended practice passed with 95% approval rate.

The chair began by thanking Rick Cornelison for completing the IEEE mandatory editorial review, forming the ballot group and overseeing the voting process. The group then immediately began to discuss the comments that were collected from the balloting process. A total of 41 comments were received and all of the critical comments were resolved before the meeting ended.

The group's responses to the 41 comments will be electronically compiled by the chair and submitted to the vice chair by the 29th of September. The vice chair will then revise the draft document accordingly and circulate to the balloting group members by October 10th.

H9: Understanding communications Technology Applied to Relaying

Chair: M. Sachdev

Vice-Chair: M. Benou

Output: PSRC Report

Established: 2006

Expected completion: 2008

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

The third meeting of the Working Group was held at 11:00 AM on September 20, 2006 in Atlanta C&D Room, Renaissance Atlanta Hotel, Atlanta, GA. Seven members and nine guests were present.

The minutes of the WG meeting held in May 2006 as distributed by Email, posted on the Web site and distributed at the meeting were approved. The group then reviewed the outline of the report and suggested reorganization of the contents. Writing tasks of two-third of the topics of the report were distributed. The drafts are due on or before November 30, 2006.

Gu Xinxin withdrew from the membership fo the WG. Oscar Bolado, Daniel Goodrich, Yi Hu, and Tony Seegers joined the WG as members.

H11: Synchrophasor Standard, PC37.118

Chair: K. Martin

Vice-Chair: D. Hamai

Output: Standard

Established: 2001

Expected Completion: 2006

Working Group H11 met in a single session. 10 members and nineteen guests were present. The minutes from the May 16 meeting were read and approved.

K. Martin reviewed the current issues. He recommended continuing the current WG or the formation of 2 new working groups to (1) handle implementation issues that are coming up and (2) work on a report of dynamic measurement and testing requirements. Both groups would have an output that could be used in the next revision of the synchrophasor standard. After discussion, it was decided that it is premature to start on dynamic measurement requirements since research is only getting started on those issues. It was also recommended to start a new WG on resolution of current implementation issues and disband this WG once the transactions paper is done. It will be proposed to start a task force at the January meeting to address implementation issues.*

The transactions paper presenting the Synchrophasor Standard was discussed. All sections have been written and put in draft 2.0. The formatting is a random mix and it has 26 pages. There is also quite a bit of overlap of topics. Editing a draft like this is very difficult for a large group in a meeting, so M. Begovic, A. Phadke, and B. Kasztenny volunteered to work together to put the document in IEEE format and edit for consistent content. They will return this next draft to the WG Chair by Dec 15, 2006.

A list of implementation issues prepared by H. Falk and M. Adamiak was reviewed. These are some of the issues that need immediate attention. While noted that we cannot make normative decisions, it was agreed that it would be best for PSRC to take a central role in making recommendations with an eye toward implementation in future revisions of the standard. These particular issues will be circulated in the WG for some early consideration, and will be passed on to the task force.

* PS. Based on the subsequent H subcommittee discussion, H11 can be extended in place of a task force/new WG and will be scheduled for a double session. The group will produce a new task statement.

H14: Telecommunication Terms for Relaying

Chair: R. Ray

Vice-Chair: R. Young

Output: Report

Established: 2003

H14 met with 7 members present.

Two assignments were reviewed and the definitions were added to the document. We received one unsolicited assignment. This included a list of about 50 terms that we have not included in the document. The group felt that many of these terms should be included. So the list has been divided up and assignments have been given to individuals to decide which of these terms should go into the document and offer up a definition for the group to review at the next meeting.

The group has decided that we would not accept any more terms to be included in the document. We will finish up our report and publish the document on the PSRC web site. After it has been out for a while we could then revisit and revise the document.

HTF1: Timetagging in Protection and Disturbance Recording IEDs

Chair: Bill Dickerson

Vice-Chair:

Output: Report

Established: 2006

HTF1 met with 20 attendees. Chair, Bill Dickerson presented a brief outline of a proposed standard for time synchronization, which generated discussion leading to a consensus to proceed with becoming a working group (developing a purpose, scope applying for a PAR).

The taskforce attendees used remaining time to write the Scope statement. Purpose statement was left to the chairman to complete.

Taskforce was converted into a working group H3.

HTF2: Broadband Communications Over Power Line Carrier

Co-Chairs: Veselin Skendzic, Mark Simon

Established: 2003

Taskforce met in a single session with 13 members / guests.

Group discussed a UTC release describing the FCC ruling update which was issued in August, and other WEB collateral. Don Sevcik from CenterPoint Energy informed the group about the BPLC project at his company. Deployment was justified based on meter reading and distribution system automation. This opens new possibilities to investigate possibility of using BPLC for protection related applications (line reconfiguration, setting group change, load shedding, failed insulator detection etc.)

Mark Simon gave the following update on FCC and ARRL activities:

Amateur Radio 500 KHz Experimental Band

The ARRL on behalf of 23 amateur radio stations has been granted a special authorization by the FCC to perform experiments on frequencies between 505 and 510 kHz. Electric utilities use the spectrum in vicinity of this frequency region for purposes of power line protection.

The spectrum allocated by Part 15 section 15.113 of the FCC rules is 9 KHz to 490 KHz. The experimental band is outside this frequency range. Additionally, the FCC has authorized the use of narrowband signaling for these experiments, further limiting interference exposure to power line protection communications. The narrowband signaling current allowed is CW (continuous wave – on/off – Morse code) with PSK31 (Phase Shift Keying) being sought. Note that PSK31 has a narrower bandwidth than CW.

The organization coordinating these experiments is “The 500 KC Experimental Group for Amateur Radio”. They maintain a web site of <http://www.500kc.com/>. This web site contains a list and the locations of the 23 authorized stations.

Unlike past requests for an Amateur Radio allocation within the power line carrier spectrum used by utilities, this special authorization should not generate any concern for electric utility protection engineers.

Taskforce was converted into a working group H2. Working group will be chaired by Mark Simon. Group is not planning to meet at the January meeting.

Liaison Reports

1. PSCC Liaison Report by E. Udren

The PSCC met in January in New Orleans and in June in Montreal. No information is available yet on the Montreal meeting. The PSCC will meet with the PSRC in January 2007 in Scottsdale, and at each PSRC Winter Meeting thereafter, as well as at Summer PES Meetings. In 2007, that meeting will be in Tampa, June 27-28.

The PLC Subcommittee began working on a new revision of C93.4, Standard for Power-Line Carrier Line-Tuning Equipment (30-500 kHz) Associated with Power Transmission Lines.

The Wire-Line Subcommittee has submitted for publication IEEE 820- IEEE Standard Telephone Loop Performance Characteristics in a 2005 revision. IEEE 487-2000 IEEE Recommended Practice for the Protection of Wire-Line Communication Facilities Serving Electric Supply Locations, was scheduled for completion of revision in June. This SC is also beginning a new standard, A Guide for the Protection of Communication Installations from Lightning Effects.

A PSCC Subcommittee is developing recommendations for dealing with security issues for IEC 61850, Communications Networks and Systems in Substations.

2. IEC TC 57 Working Group 10 Liaison Report by E. Udren & C. Brunner

WG 10 is responsible for IEC 61850, Communication Networks and Systems in Substations. WG 10 met in Nuremburg in June, and next meets in Arnhem in October.

WG 10 is currently developing approaches for substation to control center and inter-substation messaging under 61850, going beyond the intrastation communications that are the focus of the original Standard.

WG 10 is reviewing comments on the Committee Draft for 61850-7-4 Amendment 1 (Basic Communications Structure – Compatible Logical Node Classes and Data Classes – Power Quality Additions; Hydro applications). They are also reviewing comments on the Committee Draft for 61850-7-3 Amendment 1, Extension of common data classes for statistical and historical information.

WG 10 and UCA UIG together manage TISSUES process to get unclear points and errors in the Standard fixed as they are found in 61850 implementations. All manufacturers and users are obliged to post problems and solutions in TISSUES process, so that IEC 61850 can keep its promise to be an open and interoperable protocol for all manufacturers and users.

Related to WG 10 and IEC 61850:

UCA International Users' Group (IUG) held a session on IEC 61850 applications and projects at its meeting at CIGRÉ in Paris, 8/30/06. See papers at <http://sharepoint.ucausersgroup.org/>.

UCA IUG Testing Subcommittee is working on definition of station bus client device testing (substation host or concentrator, as opposed to relay which is called a server in 61850). Clients can have conformance tests and can receive certificates.

Same Testing SC is looking at how to define a conformance test on Process Bus (61850-9-2) equipment – looking at pilot project at Texas A&M under Dr. Mladen Kezunovic.

I: RELAYING PRACTICES SUBCOMMITTEE

Chair: J. W. Ingleson

Vice-Chair: T. S. Sidhu

Webmasters: T. S. Sidhu and M. Tamije Selvy

I: RELAYING PRACTICES SUBCOMMITTEE

Chair: J. Ingleson

Vice-Chairs: T.S. Sidhu and R. W. Beresh

Webmasters: M. Tamije Selvy and T.S. Sidhu

Atlanta, Georgia

1. Introduction

The Relaying Practices Subcommittee (SC) met on Sept 20, 2006 in Atlanta, Georgia. Jim Ingleson mentioned his imminent plan to step down from begin the Chair the I Subcommittee whereupon Tarlochan Sidhu will assume this role.

2. Approval of minutes of the previous meeting

The minutes of the previous meeting were approved with no changes.

3. New Members

Roy Ball was voted into the I subcommittee as a new member.

4. Reports from the Working Group Meetings

Updated information and a current report from each working group has been placed on each working group's web page, and will be updated whenever necessary. Formatting problems sometimes occur in copying WG reports to their website and thence to the SC minutes. We suggest that, if you perceive that there are formatting problems, you will consult the WG web page directly.

I1: Understanding Microprocessor-Based Technology Applied to Relaying

Chair: M.S. Sachdev

Vice-Chair: Ratan Das

Output: PSRC Report

Expected Completion Date: 2006

The sixth meeting of the Working Group was held at 11:00 AM on September 19, 2006 in Marietta Room, Renaissance Atlanta Hotel, Atlanta, GA. Two members and twelve guests were present.

The minutes of the May 2006 meeting held in Albany, NY distributed by Email, posted on the WG web site and distributed at the meeting were approved.

The Chairman reported that contributions on successive approximation A/D converters and Communication were incorporated in the report. Draft 2 of the report was distributed to the members before the meeting for comments; no comments were received.

There is only one outstanding issue in this report. The Chair would address this and will submit the report for balloting in the WG.

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

I2: Terminology Usage Review

Chair: M. J. Swanson

Vice-Chair: Barb Anderson

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

Expected Completion Date: Ongoing

The I2 Working group met at 11:00 am on Tuesday, September 19, 2006 with eight members and two guests. Mal Swanson chaired the meeting. Minutes from the last meeting were approved.

The Working Group then reviewed assignments.

Fred Friend confirmed that the C37.230 document has been reviewed.

Mark Schroeder reviewed the J3 paper on "Generators Interconnected to the System." The Working Group reviewed the term, "sequential tripping logic" from that document.

Roger Whittaker will review the C4 document, "Industry Experience with System Integrity Protection Schemes." Mal will forward it electronically to Roger.

Oscar Bolado will review the K14 document C37.234/D2 "Bus Protection."

Walt will review miscellaneous terms proposed by Moh Sachev. Barb Anderson will check the dictionaries and previous I2 documents to see if any of these have been previously defined.

Mal Swanson will follow up with the Chairmen of the following Working Groups for copies of their documents: PC37.105 (I9), C37.113 (D9), and C37.111 (H4).

Mal then presented new proposals for how to handle the I2 Working Group's output. Since a Working Group to handle revisions to C37.100 has not yet been formed, Phil Winston suggested putting our terms on the PSRC website. This will make the terms available to all PSRC members until work on C37.100 is completed. Mal will talk to the next web chairman to get this accomplished.

All terms in the documents, "Approved New Definitions #1 to 3" will be on the website. Those that were not included in the last revision of C37.100 will be resubmitted.

The document, "Suggested New Definitions #4," which had been previously approved by the I2 Working Group and the I Subcommittee, will be e-mailed to Phil Winston for Officer approval.

After several revisions, the Working Group gave their consensus for "Suggested New Definitions #5." This document will be emailed to Jim Ingelson, who will ask for a consensus from the I Subcommittee.

I3: Microprocessor-based Protection Equipment Firmware Control – PC37.231

Chair: R. Beresh

Vice-Chair: R. Whittaker

Output: Recommended Practice

Workgroup I3 met September 19, 2006 in Atlanta Georgia with 7 members and 5 guests present. The August re-circulation of the document "Recommended Practice for Microprocessor Based Protection Equipment Firmware Control" has been completed and with only two negative ballots remaining each of which are due to originators failure to vote in the recirculation. These negative ballots have been resolved according to I3 chairman Bob Beresh, and he presented ten affirmative comments for

workgroup discussion. These ten comments resulted from re-circulation of the document after the workgroup resolved the over 200 comments received from the original balloting in December. These comments were then discussed and resolved resulting in several very minor changes to wording. Several references were moved into the bibliography section. This document will now be submitted as final to the rev com.

Several workgroup members discussed the possibility of presenting this “Recommended Practice” to the Georgia Tech, Texas A and M, and Western Protective relaying conferences. Of course the paper must first be accepted.

I4: IEC Standards Advisory

Chair: E. A. Udren

Vice-Chair: M. M. Ranieri

Output: IEC Standards Advisory

The working group had a lively meeting of 8 members and 6 guests on Sept. 19, discussing a new strategy for achieving PSRC input to new IEC TC 95 relay standards under development. The resulting proposal to the PSRC management appears as an Annex to this report. The Officers and Adcom accepted the proposal that same day, and implementation effort begins right now.

The following is a summary of recent IEC activity discussed at the WG:

IEC TC 95 Measuring Relays - Program of Work

Corrigendum proposed by UK to Relay Safety Standard 60255-27

Comments missed out in voting cycle

They feel it's fundamental and corrigenda should be issued.

NCs to respond by December.

Substance – accessible parts, voltage application for routine tests, circuits for sample tests.

60255-3 Dependent Time Relays (inverse time curve equations) – revision activity is alive!
Broadening to two new standards:

60255-127 under and overvoltage relays

60255-151 under and overcurrent relays (note numbering!)

Maintenance team MT4 headed by Dr. Murty Yalla, USNC

60255-16 Impedance Relays – old and unrevised

60255-121, Functional standard for distance protection

Maintenance team MT4 headed by Dr. Murty Yalla, USNC

60255-6 Measuring Relays

Renamed 60255-1, Common Specifications

Convenor Paul Millard, UK

Seeking members for CD by 12/06

Revision plans for 60255-11, 22-1, 22-2, 22-4, 22-5, 26

IEC TC 57 – Power Systems Management and Associated Information Exchange

WG 10 is responsible for IEC 61850, Communication Networks and Systems in Substations. WG 10 met in Nuremburg in June, and next meets in Arnhem in October.

WG 10 is currently developing approaches for substation to control center and inter-substation messaging under 61850, going beyond the intrasubstation communications that are the focus of the original Standard.

WG 10 is reviewing comments on the Committee Draft for 61850-7-4 Amendment 1 (Basic Communications Structure – Compatible Logical Node Classes and Data Classes – Power Quality Additions; Hydro applications). They are also reviewing comments on the Committee Draft for 61850-7-3 Amendment 1, Extension of common data classes for statistical and historical information.

WG 10 and UCA UIG together manage TISSUES process to get unclear points and errors in the Standard fixed as they are found in 61850 implementations. All manufacturers and users are obliged to post problems and solutions in TISSUES process, so that IEC 61850 can keep its promise to be an open and interoperable protocol for all manufacturers and users.

Related to WG 10 and IEC 61850:

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UCA IUG Testing Subcommittee is working on definition of station bus client device testing (substation host or concentrator, as opposed to relay which is called a server in 61850). Clients can have conformance tests and can receive certificates.

Same Testing SC is looking at how to define a conformance test on Process Bus (61850-9-2) equipment – looking at pilot project at Texas A&M under Dr. Mladen Kezunovic.

Annex to I4 Minutes

Proposal for Process to Develop IEC/IEEE Standards with PSRC Input

Background from I4 Meeting Minutes: IEC TC 95 Program of Work – New Functional Standards Development

60255-3 Dependent Time Relays (inverse time curve equations) – revision activity is alive! Broadening to two new standards:

60255-127 under and overvoltage relays

60255-151 under and overcurrent relays (note numbering!)

Maintenance team MT4 headed by Dr. Murty Yalla, USNC

60255-16 Impedance Relays – old and unrevised

60255-121, Functional standard for distance protection

Maintenance team MT4 headed by Dr. Murty Yalla, USNC

60255-6 Measuring Relays

Renamed 60255-1, Common Specifications (Compare to C37.90.0)

Convenor Paul Millard, UK

Seeking members for CD by 12/06

Revision plans for 60255-11, 22-1, 22-2, 22-4, 22-5, 26

Recognition of opportunity for IEC-PSRC joint work and cooperation

We have close contact between the Convenor of the WG (MT4) for three of these projects and PSRC.

We can have bidirectional flow of standards content between PSRC and the IEC WG. Much more effective than voting on draft.

PSRC needs to have a process that can instantiate or tie in WGs with IEC standards development, and put them in touch.

Proposed Process

As a real-world example to help understand how this might work, think about the new project to create 60255-121, Functional Standard for Distance Relays.

The Convenor for IEC is Dr. Murty Yalla from the US National Committee and from PSRC.

The Technical Advisor (TA) to USNC (Eric Udren at this time) learns that IEC TC 95 is starting development or revision of a standard.

TA notifies PSRC Officers (& SC Chairs) of these projects.

The Officers & SC Chairs decide if PSRC might have an interest in contributing to or influencing this project. If so...

Officers identify the SC where a PSRC WG will reside, and find a champion who could be a potential WG or TF chairperson.

Publicize first TF meeting, with any available starting materials posted.

At TF meeting, the IEC Convenor or other person with information presents the project, and PSRC input potential is discussed.

If there is interest, make a PSRC WG.

PSRC WG and IEC WG exchange information through IEC Convenor during development of the first Committee Draft (CD).

NOTE: This is informal, not official, communications. The IEC WG is not obliged to accept any PSRC input or requests. The Convenor and PSRC chairperson must have an understanding that the input is valued and will be used or at least considered.

The IEC WG is officially a closed process until a Committee Draft (CD) is issued for comments and voting by all the National Committees.

The IEC Convenor, even if from the US, is not obliged to force a PSRC position in the IEC work.

However, we expect that in practice most or all of the content can be agreed between the IEC and PSRC WGs.

In this way, the CD for the new or revised standard should contain substantial PSRC input, or should be acceptable to PSRC, and should be coordinated with IEEE PSRC standards as much as possible.

In the event that differences remain, the CD is still subject to the formal IEC voting process with comments from the National Committees.

The US gets one vote, same as each of the other nations.

If PSRC members want more direct personal input and influence than this, we have always had the ability to request that US participants be appointed as WG members.

These appointed members must be able to travel to meetings, the majority outside the US.

These members have been tough to identify in recent years.

Once an agreed standard is approved through the IEC process, it can be issued as a dual-logo IEEE/IEC Standard

Issued in the common format already agreed to by IEEE and IEC that we should be using anyway.

The PSRC WG can still write a promotional paper for an industry meeting

Paper can name all the participants (the published IEC standard never lists names of developers).

This process does not give PSRC full control, but a lot more influence than before. This can bring better coordination and, we hope, single common standards in key areas that we can all use.

I5: Trial-Use Standard for Low Energy Inputs to Protective Relays

Chair: E. A. Udren

Vice-Chair: P. G. McLaren

Output: New Trial Use IEEE Standard P1331

The WG did not meet. Its work is complete and the working group has been disbanded.

C37.92, Standard for Analog Inputs to Protective Relays from Electronic Voltage and Current Transducers, was published in October 2005.

The completed WG paper is submitted for presentation as part of a panel session at the IEEE Power Systems Conference and Exposition (PSCE) at the end of October 2006 in Atlanta. The panel session, PANEL-21: Applications of Low Energy Analog Current and Voltage Transducers for Protection", will take place on Wednesday November 1 from 9 AM to 12 noon, in the International C room of the Atlanta

Marriott Marquis Hotel where the PSCE meeting is based. For more details, see <http://www.pscexpo.com/TempDev/Papers/PublicSessionIndex3.asp?Sessionid=1070>

This panel session addresses applications of a modern technology for power system protection. Low energy analog current and voltage transducers are an emerging technology for protective relay applications. Traditional electromechanical protective relays depend on the energy from conventional instrument transformers for operating power as well as measuring the outputs of those transformers.

Conventional instrument transformers have some limitations, particularly when primary signals of non-fundamental frequency exist on the power system and need to be measured accurately.

Non-conventional current and voltage transducers may provide more accurate signals over a wider frequency range than conventional, but with insufficient power to operate electromechanical relays. Solid state analog and digital protective relays operate from separate auxiliary power sources and can measure low energy voltage and current signals.

The panel session includes:

Eric Udren of KEMA for PSRC WG I5, "Overview of IEEE C37.92-2005, Standard for Analog Inputs to Protective Relays From Electronic Voltage and Current Transducers"

Charles Henville, Consultant and former BC Hydro, "A Trial Application of Optical Transducers for Protective Relaying"

Lujbomir Kojovic, Cooper Power Systems, "Application of Rogowski Coils used for Protective Relaying Purposes"

Farnoosh Rahmatan of NxtPhase, "Design and Application of Optical Voltage and Current Sensors for Relaying"

Special presentation by Veselin Skendzic of Schweitzer Engineering Labs, "Interfacing Low energy sensors to protective relays: Current trends, architectures and system reliability issues"

I6: Revision of C37.90, Relay and Electrical Power Apparatus

Chair: M.M. Ranieri

Vice-Chair: J. Teague

Output: Revision of ANSI/IEEE C37.90-1989 (R1994)

WG has been disbanded

I7: Guide for the Application of Rogowski Coils used for Protective Relaying Purposes

Chair: L. Kojovic

Vice-Chair: V. Skendzic

Output: New IEEE Guide

Group met on Tuesday with 10 members and 3 Guests. Draft 3 was discussed. All comments will be implemented and discussed among the WG members by the January 2006 meeting. Plan is to have final Guide Draft 4 completed for balloting by January 2006 meeting.

Final Guide Draft 4 will be available to all PSRC members on the PSRC I-7 WG WEB Site, <http://www.pes-psrc.org/i/107.html>

Next meeting: Need room for 20 and a computer projector (CP)

I8: Guide for Application of Optical Current & Voltage Sensor Systems

Chair: H. Gilleland

Vice-Chair: B. Pickett

Output: New IEEE Guide

The meeting called to order by Chair Harley Gilleland . There were 14 members and 10 guests. All members and guest were introduced; three of the guest became members. Agenda and Work Assignments from HG's email of 9/11/06 were passed out and discussed in detail for all ten sections. The key discussion included the need to get more support and to accelerate the progress from the Working Group – and specific work assignments for the group prior to the next meeting. All members were asked to review the material on the Working Group website and provide their comments to the Team Leaders.

I9: Revision of C37.105 - Standard For Qualifying Class 1E Relays And Auxiliaries For Nuclear Power Plants

Chair: S. Usman

Vice-Chair: R. Ball

Output: Revision of C37.105

The WG met to review C37.105D10-3 draft and incorporated the changes as C37.105D10-4. We added a new reference to IEC 60255-21-3 Part 21, Section 3, Seismic Testing in clause 4 and also revised Table 1 to clarify the information previously shown as non-contact and contact modes.

Three tasks still remain. Table 2 needs to be revised to agree with information shown in C37.90-2005. Figure 1 requires coordination of the reference clauses shown in each step of the process and the information shown for Table 3 needs to be verified. A summary list of the changes that we made to our original balloted draft will also need to be compiled for the re-balloting.

All our active WG members received an email September 18 to provide an update for them on our new assignments and a copy of C37.105D10-4. I believe that we may be able to complete our assignments and re-ballot this standard prior to our January 2007 meeting.

I10: C37.98-1987 - Standard Seismic Testing of Relays

Chair: M. Nemier

Vice-Chair: M. Bajpai

Output: Revision of IEEE Standard C37.98

This working group did not meet.

I11 - Timing Considerations for Event Reconstruction

Chair: Jim Ingleson (j.w.ingleson@ieee.org)

Vice-Chair: Open Position

Established: January 2006

Completion: May 2007

The second meeting of this group under the number I11 will be held at the Sept 2006 PSRC meeting in Atlanta, GA

- > Continuing high attendance at meetings indicates high interest in this area.
- > New assignments made at this meeting were recorded by Jim Hackett.
- > Chair will accept changes to date and remove section author names from completed sections.
 - > Each person who listed themselves as a Member of this WG has been assigned to review at least one section of the work, before the next meeting.
- > All sections of the report are complete in draft and are all posted at the address below, and linked from this page.
- > Bill Dickerson will edit his contribution on IRIG-B network and make 3 (or more) sections out of it.
- > Ken Behrendt will send his section to the Chair as a .doc file. (done.)
- > GPS clocks are now almost perfect compared to the others variables discussed in our report. Earlier clocks carried uncertainty ratings of 1 millisecond, but probably perform much better than this. New clock typically have uncertainties of 1 microsecond.
- > The connection of GPS clocks to various devices is done by a variety of methods, and we have found no single reference that covers all the methods. An NPCC report states that the interconnection network is assumed to contribute an uncertainty of 1 ms and a variable delay of up to 1 ms. There has been a general feeling at meetings of ITF2 that most installations are probably better than this, but there is no documentation.
- > Internal delays in recording devices are not widely understood, and are have not been quantified. Bill Dickerson and Jim Hackett have each prepared test procedures, which will be included in the group's report. Internal recorder delays on the order of 4 ms.
- > Additional delay is contributed by instrument transformers and wiring in the case of analog signals, and contact position sensing and wiring in the case of digitals. Assignments were made.
- > Jim Ingleson has reordered the report page to more closely correspond to the original outline.
- > Material Accumulating for this report will appear at this location: l11report.html

I12: Revision of C57.13.1, IEEE Guide for Field Testing of Relaying Current Transformers

Chair: M. Meisinger

Vice-Chair: D.R. Sevcik

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

Expected Completion Date: 2006

I-12 Met on 9-19-06 with 6 members and 3 guests.

With the guidance of Mohindar Sachdev the document has completed recirculation balloting and all negative ballots have been resolved.

The document is presently with RevCom for approval.

The Working Group also discussed what, if anything, needs to be done next (i.e., presentations at Main meeting, summary paper, etc.)

I13: C57.13.3 IEEE Guide for Grounding of Instrument Transformer Secondary Circuits and Cases

Chair: M.S. Sachdev

Vice-Chair: B. Mugalian

Output: Guide

The standard has been published and the working group has been disbanded.

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

Chair: John Tengdin

Vice-Chair:

Minutes of Joint Substations WG C5 & PSRC WG I 14 - Revision of C37.2-1996

Attendance – 14 members (Apostolov, Bartok, Beach, Beresh, Dood, Fodero, Huntley, Gilbert, C. Jackson, Lacroix, Preuss, Ranieri, Sachdev, Tengdin)

- Announced that this is a joint PSRC/Substations working group with common membership and minutes
- Reviewed Alex Apostolov's proposed Annex – a table cross-referencing C37.2 function numbers to IEC 61850 logical nodes
- Reviewed Eric Udren's proposed use of Device 16 for communications devices
- Reviewed John Tengdin's proposed revisions to suffix letters
- Discussed the possible labeling of a few function numbers for future (2012) obsoleting
- Announced that all Substations C Subcommittee WGs will meet jointly with PSRC in Jan 07
- Discussed how multiple suffix letters might now being used (C37.2-1996 is silent on this, but implies that only one suffix be used – since two letter suffixes are defined)
- Action Items prior to January 07 meeting:
 - Apostolov to review Tengdin's edit of his cross reference table, and prepare a revised annex
 - Udren to prepare an example of a protection one line diagram utilizing his proposed use of device 16
 - Tengdin to prepare specific recommendations for the revision of suffixes
 - Tengdin to name a Vice Chair
- All members, but particularly utility engineers and consultants, to provide examples of the present use of multiple suffixes

I15: Revision of C37.110, IEEE Guide for the Applications of Current Transformers Used for Protective Relaying Purposes

Chair: G.P. Moskos

Vice-Chair: B. Jackson

Established: 1998

Output: C37.110

Expected Completion Date: 2006

The working group met in a double session with 3 members and 5 guests. Balloting of PC37.110 closed on April 9, 2006. The breakdown of the balloting results was 89.6% affirmative, 6.4% negative, and 4.0% abstention. There were 8 negative ballots consisting of 75 comments (Technical and Editorial) which needed to be resolved. To date, 65 of the 75 negative comments have been addressed. Once all the comments are resolved, Draft 9 will be used for the Re-Circulation Ballot.

All of the negative ballot comments will not be resolved prior to the October 16, 2006 dead line. Therefore the working group has requested a one year PAR extension in order to address the remaining negative comments and proceed to the Re-Circulation Ballot. The IEEE-SA Standards Board Extension Request form was submitted to the Nes Com Administrator on September 15, 2006.

I17: Trends in Relay Performance

Chair: W.M. Carpenter

Vice-Chair: J.D. Wardlow

Output: Special Report

This working group did not meet.

5. Task Force Reports

ITF1: Relay Service Letter Database

Chair: J.W. Ingleson

The database was last updated on March 15, 2005, and is available on the ITF1 area of the SC web site. Jerry Jodice has been asked to take over responsibility for this TF and will let the subcommittee chair know if this is possible.

ITF3: Application Testing of Relay Equipment

Chair: J. Jodice

Based on the high level of interest in this subject, all present were noted as Members, and have been documented as "I TF 3" Members.

The Objectives of the activity are defined in the following documents, which are attached to, and form a part of this report.

1.Dated January 4, 2006, to Phil Winston , PSRC Chair , from Jim Ingleson, Chair NPCC Task Force on System Protection.

This letter requests authority to begin a" PSRC Task Force to evaluate the feasibility of drafting a new Standard to address [the ability of a relay to operate selectively and reliably for a variety of system events based on the application and extremes of system conditions that would realistically be encountered in implementation of these schemes].

2. Project Assignment Title: "WG on Applications Testing of Protection Systems"

The TF Members discussed options for achieving an applications oriented test approach beginning with Transmission Protection, which would provide a clear understanding of the scheme operating characteristics. As part of the getting started discussions, the following primary scope was established.

**It is the performance of the scheme that will be addressed, not that of individual measuring relays.

** Standardized Tests for each protection application [not calibration tests] are the objective.

**A Vocabulary will be established using the following References, to incorporate prior work in this subject area: IEEE: PSRC I13 "Relay Performance Testing", and CIGRE: SC34.10" Analysis and Guidelines for Testing Numerical Protection Schemes"
Copies of these references are attached to this report.

**A Detailed Abstract for consideration of WG status will be presented at the January PSRC I SC Meeting

**The Chair will send both References to all members with the objective of developing the Vocabulary. Drafts of comments are requested, in advance of the January meeting for discussion at the January Meeting.

NB: During the I SC meeting a possible conflict with C11 was noted. Jerry Jodice have read C11 Draft 2, and found both "Incorrect Operation "[1.24] and "Application Testing" [2.2] addressed. He believes that TF 3 should develop these subjects in further detail, as part of it's scope. Whether TF 3 should proceed as an independent body of work, potentially to be developed as a Standard, or the subject of "Application Testing" should be incorporated in another WG should be addressed, at a higher organizational level, to insure the work is effective. Guidance of I SC on how to address this matter is needed.

ITF4 Reaffirmation of C37.90.3

Chair: J. G. Gilbert

Eight members met briefly to review progress of the ballot. With approximately 65% of the balloting group responding to date, no negative ballots have been submitted. If any negative ballots are received the task force members will work to resolve the negative ballots by October 16, 2006, the submittal deadline.

6. Liaison Reports

Nothing new to report

7. Co-ordination Reports

Nothing new to report

8. New Business

A new task force (ITF2), to investigate the need for more compiling checks on relay settings, has been proposed. This task force will examine if there is reason enough to look at various relay types and

their “forbidden” zones in order to harden the relays against cyber attacks. This task force will meet during the January 2007 meeting and the meeting will be chaired by Dr. Peter McLaren.

J: ROTATING MACHINERY PROTECTION SUBCOMMITTEE

Chair: W. G. Hartmann

Vice Chair: K.A. Stephan

The Subcommittee met on 9/20/06 with 10 members and 12 guests. Minutes from the May 2006 meeting in Albany were approved.

Reports from the WG Chairs

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

Chair: J. Gardell

Vice Chair: P. Kumar

Output: Report to the Main Committee

Meeting #12

The Working Group met for a double session with 8 members and 4 guests on September 20, 2006.

Draft 3 of the report (which put the various assignments into IEEE format and somewhat homogenized the various sections) was reviewed. 6 out of 10 sections were reviewed. The remaining sections have been assigned to working group members for review.

Writing assignments were given to Dale Finney-produce figures in Section 3, review acronyms and term usage in whole document. Chris Ruckman-review and ensure accuracy in recap of C37.96, Wayne Hartmann & Dale Finney-review sections on short-circuit issues with ASD. Prem to complete review of Section 6. Subhash Patel, Dale Finney, & Chris Ruckman to review Section 7. Matt Basler to provide write up on Section 8 to be reviewed by Mike Reichard. Section 9, the Conclusions, to be done after assignments are in. Assignments are due by November 30. Wayne Hartmann to request Eaton as a corresponding member for review. January meeting-need double session with computer projector.

J2: Protection Considerations for Combustion Gas Turbine Static Starting

Chair: Mike Reichard

Vice Chair:

Output: Report to the Subcommittee

Fourth Meeting

Introductions, 10 members, 11 guests

The Task Force reviewed and approved the May meeting minutes.

Takeru Murao of Toshiba gave a presentation titled “Protection Relays for Static Starting Turbine Generator”. A copy of the presentation will be sent to each WG member.

Dr. Jurgen Holbach of Siemens gave a presentation titled “100% Stator Ground Fault Protection”. A copy of the presentation will be sent to each WG member.

Mike Reichard gave a presentation titled “Short-Circuit Characteristics During LCI Start”, which discussed theoretical analysis of generator fault current during LCI startup sequences. The WG was in general agreement with this analysis. ” A copy of the presentation will be sent to each WG member.

Assignments were made to develop an outline for the paper. Wayne Hartmann, Zeeky Bukhala, and Chuck Mozina volunteered to assist. The first draft will be due November 30, 2006.

The target completion date for the paper is May 2008.

J2 requests a room, with projector, for 25 for a single session during the January meeting.

J3: Protection of Generators Interconnected with Distribution System

Chair: E. Fennell

Vice Chair: R. Pettigrew

Output: Report to the Main Committee

The Working Group (WG) did not meet. The WG paper is completed and has been reviewed by the PSRC Officers. The paper will be a report posted on the PSRC website.

The working group will be kept active with the possibility of presentation at a regional relay conference.

J4: Revision of C37.102 AC Generator Protection Guide

Chair: M. Yalla

Vice Chair: K. Stephan

Established 2000

Output: Guide

Expected Completion Date: 2006

Status: 19th meeting

The Working Group did not meet this session.

Draft 8 of C37.102 was recirculated on September 8th due to changes required by IEEE legal staff review after the balloted guide was submitted to RevCom. This 10-day recirculation closed on September 18th. The results of this second recirculation are as follows:

Total number of eligible balloters:	183
Ballots received:	155
Affirmative Ballots:	144
Abstentions:	14
Negative Ballots:	0

The results are 100% affirmative with one pending issue. An IEEE-required modification to an IEC copyright release for a figure used in the Guide needs to be received from IEC. The chair is working with the IEC to resolve this issue. The Guide is expected to be re-submitted to RevCom for approval this month.

J5: Generator Protection Setting Criteria

Chair: C.J. Mozina

Vice Chair: M. Reichard

Output: Paper

Introductions, 12 members, 17 guests.

The chairman reviewed the status of the WG Transaction Paper, which has been successfully balloted by the WG and Subcommittee. As a result of the PSRC officers review a number of comments were received from Charlie Henville. These comments were discussed at the May WG meeting.

The chairman along with a select group of WG members addressed Charlie Henville's comment that resulted in adding about three pages to the paper. The entire WG session was spent reviewing these changes to the paper as well as an addition prompted by the recent article in the PES Magazine on Blackouts. Specific changes to the paper included:

A paragraph in two sections of the paper to address the importance that selection of proper GSU and Aux transformers taps play in getting full VAR support from the generator.

Added substantial material to Section VII of the paper explaining the role of the OEL control and V/Hz limiter and their coordination with generator field short time capability and field forcing during faults.

Added a paragraph that discussed the protection of the excitation transformer and coordination with field short time capability.

Addressed the fact that the V/Hz capability of the GSU is defined on the primary (HV) side of the transformer.

Since major changes to the WG paper were made to address the areas cited above the paper will be re-balloted by the WG and Subcommittee. The chairman will send the revised paper out for re-balloting with

ballots due back by Nov. 15. The chairman is prepared to present the paper at the Jan. PSRC meeting and submit the paper for presentation at the June PES 2007 General Session in Tampa.

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

Chair: J.T. Uchiyama

Vice Chair: R. Das

Co-Vice Chair: Mike Reichard

Output: Revised Guide

WG J7 has completed their assignment. The revision of C37.101 has been approved by RevCom.

JTF1 Motor Bus Transfer

Chair: Jon Gardell

Vice Chair: Dale Fredrickson

Output: Transactions paper or report

Meeting # 2 - 9/20/2006

The Task Force met for a single session with 7 members and 14 guests on Wednesday, September 20, 2006.

The scope of the TF is to "Investigate protection and control issues and phenomenon impacting the effectiveness and success of safely transferring buses primarily consisting of motors from one power source to another.

The TF discussed a number of issues relevant to motor bus transfer, including the need to evaluate motor bus conditions prior to and just after opening the breaker (e.g. static or dynamic phase angles), performance modeling and testing, frequency response and accuracy required in relays utilized, and the relevance of ANSI C50.14 limit of 133% volts per hertz. Assignments to investigate the issues discussed and report back to the TF were proposed and several attendees agreed to assist with this effort by December 1st.

The TF will meet in January for a single session, 25 people, with computer projector to review and develop plans to complete our assignment.

Liaison Reports

Electric Machinery Committee

C.J. Mozina

The EMC met for their annual meeting at the PES General Meeting in Montreal in June 2006. The minutes of this meeting are not as yet posted on their web site --www.ewh.ieee.org/soc/pes/emc/index.html

IAS I&CP Committee

C.J. Mozina

The next meeting of the I&CPS committee will be in Oct. 2006 in conjunction with the IAS General Meeting in Tampa, FL. Minutes of the last I&CPS meeting were published in the May PSRC minutes.

Coordination Reports

None

Old Business

C37.96 Reaffirmation. The subcommittee will entertain a motion to create a working group for revision of this guide at the January 2007 meeting.

The subcommittee reviewed last meeting's suggestion on a working group to expand on loss of field relays operating under high voltage and high reactive power flow. The subcommittee decided that Working Group J5's paper has enough coverage on this topic to be included in the next revision of C37.102 without forming a new working group.

New Business

Discussed PES GM "Super-sessions." Per the PSRC officers request for topics, J subcommittee suggested a Distributed Generation (DG) session to include J3's report on Protection of Small Generators Interconnected to Power Systems among other PSRC works.

Joe Uchiyama reported on NERC task force comments. As a part of "Beyond Zone 3", NERC is preparing a document to review the backup relay settings for generators larger than 20 MW.

It was suggested to update the Generator Protection Tutorial, 95 TP 102, to include improvements made in the newly revised C37.101 and C37.102 guides. A task force will be convened in January 2007 to explore this update.

It was suggested to revisit doing a generator protection survey. The following discussion determined that with today's multi-function generator relays, most all of the functions needed are available and it becomes a question of whether to enable them or not. It may be better to focus our efforts on producing guidance on how to utilize the protection functions, therefore revising the tutorial takes precedence.

In-Service Aberrations

K: SUBSTATION PROTECTION SUBCOMMITTEE

Chair: C. R. Sufana

Vice Chair: F. P. Plumptre

The Subcommittee met Wednesday September 20 2006, at Atlanta, Georgia with 17 members and 27 guests attending. The minutes of the previous meeting in Albany were approved.

ITEMS OF INTEREST FROM THE ADVISORY COMMITTEE MEETING:

Charlie Sufana reported:

1. Those interested in the Web Master position for the PSRC advised to contact one of the officers.
2. The 'My Project System' has experienced some teething problems. Any ongoing problems should be reported to Jeff Gilbert, our Standards Coordinator.
3. If there is any interest in helping out at the O & P meeting please advised one of the officers.
4. WG chairman meeting for next meeting will be on the first day at 8:00 AM same time as Jeff Gilbert's meeting.
5. If your WG activities are done please let the officer know in case you are interested in giving a talk at one of the regional protection meetings.
6. The IEEE copy write statement must be read out at the beginning every meeting per instructions from IEEE HQ.

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

The Working Group K01, Protection of Transformers Against Faults and Abnormal Conditions, met in the Atlanta B Room, Renaissance Atlanta Hotel, Atlanta, GA at 08:30 AM on Wednesday, September 20, 2006. Thirteen members and seventeen guests were present.

The minutes of the May 2006 meeting of the Working Group distributed via Email, posted on the WG Web site and distributed at the meeting were approved.

The Chair reported that Draft 6 of the guide was submitted for pre-balloting review and some editorial comments were received. These comments were addressed and the resulting Draft 7 was submitted for starting the balloting process. As a first step, the formation of the balloting group was started. The deadline

for signing up was extended to September 27, 2006 so that the members of the WG, K Subcommittee and other members of the PSRC can join the balloting group.

The balloting will start at the end of this month and will be completed by the end of October. The intention is to address the comments from balloters as they are received. This would give a chance for completing the balloting process by the end of December if there are no issues that need discussion at the next WG meeting.

Some issues that are likely to arise during the balloting were discussed and the WG input was received. The WG expressed the opinion that a Guide for protecting phase shifting transformers would be an appropriate project on the completion of this guide.

At the conclusion of this business the meeting was adjourned.

For next meeting single session 45-50 with computer projector.

K3: Reducing Outages Through Improved Protection And Autorestitution In Distribution Substations

Chair: Bruce Pickett

Vice Chair: Tarlochan Sidhu

Established, 2002

Output: Paper

Draft 8.0

Meeting not held.

Next meeting – non required. Chair and Vice Chair will meet informally to discuss the document.

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

Chair: Simon Chano

Vice Chair: Dean Miller

Established, 2005

Output: Report to the PSRC

Draft 1.0

Assignment - Develop a document that addresses the considerations in applying protection, control and monitoring functions that can be common in modern micro-processor relays. Discuss methods of integration and application of these functions into the overall protective system in order to reduce duplication, improve reliability and enhance simplicity. This document addresses subjects related to specific topics such as Breaker failure; Automatic reclosing; Synchronism check; Voltage monitoring; Oscillography and event recording; Remote and local breaker control; Breaker tripping; Duplicate Protective schemes and consideration issues related to maintenance and device testing.

The WG met on Tuesday morning, September 19, with 11 members and 4 guests present. We had two new members joining the working group by taking on writing assignments. Four new writing assignments were made on the following subjects: Application of Control Functions (including 25, 27/59, & 86), Monitoring Functions, and Human Factors for Consideration, and as part of Human Factors, Means of Documentation.

Bogdan Kastenny presented the modifications the he was proposing to the section on breaker failure relaying. This lead to a discussion on the term “backup relaying” and the factors to consider in weighting different parts of the protection design toward dependability or security. Mike Thompson will work with Bogdan in completing this section of the paper. The Working Group will meet in January in a single session.

We will need a room for 20 people with a computer projector.

K6: SUDDEN PRESSURE RELAYING

Chair: Randy Crellin

Vice Chair: William Gordon

Established:

Output:

Expected Completion date:

Status:

The working group did not meet during these meetings.

Four members of the WG (randy Crellin, Don Lukach, Bill Gordon, and Charlie Sufana) are currently working on writing assignments to consolidate the information that was received into an initial draft.

Our current plan is to complete the initial draft by December and submit the document to the full working group prior to the January Meeting for review and comments.

For the next meeting, in January we would like to request a single session for 25 people and a computer projector.

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: Reviewing Draft 15

The Working Group met on Tuesday, September 19 with 2 members and 0 guests. Draft 15 is presently in a recirculation ballot. So far, all ballots have been affirmative with no comments. All negative ballots were resolved prior to the recirculation. Hopefully the Guide will be ready to submit to RevCom after the ballot closes.

Charlie Henville discussed some protection issues on EHV shunt reactors equipped with neutral reactors used on lines with single-pole tripping. He also discussed grounding the neutral point of shunt reactors connected to transformer tertiary delta windings when the reactor breaker is at the neutral end.

Next Meeting: none required.

K8: GUIDE FOR THE PROTECTION OF SHUNT CAPACITORS

Chair: Pratap Mysore

Vice Chair: xxx

Established, 2006

Output: Revision of ANSI/IEEE C37.99

Expected Completion date: 200x

Status: Reviewing Draft xx

The working group met for the first time in one session on Wednesday, September 20, 2006 with fourteen attendees. Contents of the existing guide were reviewed and several assignments were made. It was decided to have presentations during upcoming meetings on protection methods not covered in the guide.

We need one session with 25 in attendance for the next meeting. We need a computer projector as a presentation is planned.

It is also requested that this session will not be concurrent with K-14 as the presenter is the chair of K-14.

The next meeting requirements are for a single session for 25 people with computer projector.

K9: ARC FLASH

Chair: Karl Zimmerman

Vice Chair: Roger Hedding

Established: 2005

Output: Technical report

Expected Completion Date: 20xx

Assignment: Write a technical report to the Substation Subcommittee on protection tools that mitigate the effects of arc-flash and how arc-flash impacts protection.

Working group K9 met on Tuesday afternoon with 9 members and 12 guests. After the introductions were made, and minutes of last meeting were discussed, the assignment of the working group was reviewed.

Tony Sleva borrowed the definitions from the NFPA 70E.

Need someone to assist Elmo in writing section 4.0 on non protective relaying methods of Reducing Arc-Flash.

Karl reviewed the areas he wrote in section 5.0. The group was assigned the task to review 5.1 through 5.4

Roger Hedding to make a presentation on Optical recognition of Arc flashes at the January meeting.

The rest of the document was reviewed.

It was suggested that the document consider voltages from 1kV thru 15kV. This was discussed and decided to expand to include from 480v to 34.5kV.

Tony Sleva presented some graphical interpretation of IEEE 1584 for several working levels.

Tony Sleva to help review John Boyle's writing assignment in the Appendix.

Chris Ruckman to review section 4.0

Dale Fredrickson to review the definitions section.

We request a single session for the January meeting with room for 30 participants and a computer projector.

Next meeting – single session 25 people with computer projector.

K10 (Ex KTF1): SCC21 DISTRIBUTED RESOURCES STANDARD COORDINATION

Chair: Gerald Johnson

Vice Chair: TBA

Established, 1999

Expected Completion Date: 200x

Output: Standard through the SCC 21

K10--SCC21 Distributed Resources Standard Coordination working group met on Sept 19, 2006, with 7-members and 3-guests. I updated the group on progress of the active 1547 working groups based on the August 2006 meetings in Las Vegas. The active working groups consist of:

- P1547.2 "Draft Application Guide for IEEE Standard 1547, Interconnecting Distributed Resources with Electric Power Systems"
- P1547.3 "Draft Guide For Monitoring, Information Exchange, and Control of Distributed Resources Interconnected with Electric Power Systems"
- P1547.4 "Draft Guide for Design, Operation and Integration of Distributed Resource Island Systems with Electric Power Systems"
- P1547.6 Recommended Practice for Interconnecting Distributed Resources With Electric Power Systems Distribution Secondary Networks" Joe Koepfinger, Chair; Tom Basso, Secretary

Draft 5.0 of the Application Guide is available on the SCC21 web site and was forwarded to K10 members prior to this meeting. The 1547.2 working group is working hard to finish the guide in 2007. The group had face to face meetings in Feb, June and August, had a webcast/teleconference meeting Sept 5, and has another scheduled October 2. The next face to face is scheduled for late January 07 and we plan to have Draft 6 of the document ready for that meeting. The 1547.3 document has been balloted and negative ballots were resolved at the August meeting. P1547.4 and .6 are moving forward and their latest drafts can be found on the SCC21 Web site. If you have special interest in the progress of a particular working group or would like to provide input, let me know and I will supply the appropriate password to get to the latest draft.

For the next meeting one session 10-15 people no A/V

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

Chair: Frank Plumptre

Vice Chair: Dan Hamai

Established, 1999

Output: Guide for the application of protection on transmission series capacitor banks

Expected Completion Date: 2006

Draft 9.3

PREAMBLE SENT OUT TO WG MEMBER PRIOR TO MEETING - This document has gone through most of the balloting process. The results for the rebalot for this document shows:

93 eligible people in the ballot group

64 affirmative votes

6 negative votes with comments

2 negative votes without comments

9 abstention votes

81 votes received = 87% returned.

A substantial number of the negative ballots were from members of the series capacitor equipment group within the PES.

We have the necessary approval rating 64 affirmative/81 eligible ~ 79% and have made an attempt to resolve the negative ballots. However, discussions with Matthew Ceglia, Program Manager, in IEEE standards has indicated that a stronger effort needs to be made to resolve negative ballots, particularly if the negative ballots are from another group within PES. Matthew had indicated we could still proceed with submission to NESCOM (give we have the required number of positive votes. However the guide would unlikely pass an the NESCOM meeting.

In light of this, K13 has the following options to consider:

1./ Put the guide forward to NESCOM as is. As explained earlier, the guide is unlikely to pass muster.

2./ Resolve all negative ballots and rebalot the entire document. Note that complete resolution would require substantive changes requiring a complete rebalot. Given the required time line for this and considering our second PAR extension runs out in December 2006, this option does not seem practical.

3./ In a conference call held September 12, 2006 with members of the capacitor sub-committee in T & D, Dan Hamai (Vice Chair of K13, Jeff Gilbert (PSRC Standards Coordinator, F Plumptre (Chair of K13) and Matthew Ceglia (IEEE Standards) the option was put forward by Ma to cancel the PAR (note another PAR extension is not likely possible given that we are now in year 6 of when the original PAR was established).

The PAR would be resubmitted as a new proposed guide with joint sponsorship by the Capacitor Sub-Committee in T & D. Though PSRC would be the primary sponsor regarding administration, member of the Capacitor Sub-Committee would be equal participants in the development of a guide.

Dan Hamai and I favour option 3./ However, before we go to the officers of the PSRC, there must be discussion and agreement of this concept with K13 members first.

Accordingly, please read this email. Dan and I will be contacting you either by phone or during the PSRC Atlanta meeting.

Note: This information has been give to Charlie Sufana for information purposes. If there is concurrence on option 3., Dan and I via the K subcommittee will put this proposal forward to the PSRC officers for their consideration.

POST MEETING COMMENTS

Options were discussed in the September K13 meeting. All WG member unanimously agreed to pursue option 1./ "Put the guide forward to NESCOM". (which was done).

This option was also discussed with the PSRC officers and has their support.

Future meeting request, 1 session, for 10 people, no AV.

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

Chair: Bogdan Kasztenny

Vice Chair: Steve Conrad

Established, 2005

Output: Guide for the application of protection on power system buses

Expected Completion Date: 20xx

Draft 2

The WG met in single session with 23 members and 8 guests on September 20, 2006 in Atlanta, GA.

The minutes from the May meeting in Albany were approved with the change in title as the only corrections to the minutes as printed.

Draft 2 of the guide was discussed, with the chairman commenting on the status of several clauses. Annex A "Calculation Examples for a High Impedance Scheme" was discussed. The draft contains two separate submissions which will need to be merged into a single clause. Mike Thompson and Gustavo Brunello volunteered to review this Annex and associated Clause 7.1.1 High-impedance Methods.

Annex D "Ct Position for Live Tank Breakers, Breaker Failure Considerations" has been expanded to show additional faults adjacent to bus and breakers. Discussions pertaining actions required for these added fault locations are to be included and resubmitted to the WG. Sam Sambasvian volunteered to complete this assignment.

A presentation on Relay Performance under Fault Conditions by Lubomir Kojovic has been postponed until the January meeting.

John Horak submitted a written discussion for Clause 6.0 Relay Input Sources. Arvind Chaudhary volunteered to review this clause.

Clause 8.11 Application of Auxiliary Current Transformers – will be reviewed and the consideration of the use of auxiliary CTs for low and medium impedance applications will be discussed. Ration matching of CTs via ration taps will be reviewed as well. The clause will be renamed "Application with different ratio current transformers) Pratap Mysore volunteered to take on this clause.

The chairman request that the outstanding writing assignments be submitted to him by November 1, 2006.

This WG will need a Computer Projector, 35 people, Double Session for the Next Meeting in Phoenix, AZ.

Liaison Reports:

There was nothing to report on these reports. However, it was suggested that the relevance of reporting on these items needs to be reviewed, as well as confirming the individual responsible for reviewing the item. In addition, there may be new items/proposed documents where liason is relevant for example, the activities of the Substation Technical committee in PES.

Frank Plumtre to assign someone to look into this by next meeting.

Old Business

None to report

New Business

1./ Discussion led by Bogdan on relay misoperation for an A-B-G external fault, saturation voltage got high on unfaulted C phase in an industrial environment.

Problem occurs because unfaulted phase saturates because of A-B neutral current flowing through C phase magnetizing circuit. Solution raise pu and cross phase blocking.

Other things to consider: use as high a CT ratio as possible, if low ratio CTs used consider std. C37.22 for Metal Clad Switchgear

2./ Pratap Mysore is the new vice chair For K subcommittee

Presentations:

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

Consideration for loss of AC voltage the output of working group D7 was presented by Elmo Price.

Wayne Hartman presented the work from J3 on Small Generator Protection.

Future Meetings:

May 14-18, 2007	Nashville, TN
September 17-20, 2007	Charlotte, NC
January 7 – 10, 2008	San Antonio, TX

The meeting was adjourned by Chairman Winston.