



POWER SYSTEM RELAYING COMMITTEE

OF THE

IEEE POWER ENGINEERING SOCIETY

MINUTES OF THE MEETING

Sept. 11-13, 2005

Calgary, Alberta, Canada

Final

Approved

**Power System Relaying Committee
CIGRE B5 Study Committee
Main Committee Meeting Agenda
September 11-14, 2005
Westin
Calgary, Alberta, CA**

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|--------------|---|--------------------------------|
| I. | Call to order / Introductions | Phil Winston |
| II. | Welcoming Remarks by CIGRE President | Yves Filion |
| III. | Approval of Minutes/Financial Report | Miriam Sanders |
| IV. | 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/Paul Hindle |
| | D. UCA Report | John Burger |
| | E. EPRI Report | Joe Hughes |
| | F. IEC Report | Eric Udren |
| | G. Standard Coordinator's Report | Jeff Gilbert |
| | H. Substation Committee Report | Jim Evans |
| | I. Other Reports of Interest | |
| V. | Awards/ Recognition | Frank Plumptre |
| VI. | Subcommittee Reports | Phil Winston |
| | I - Relaying Practices | Jim Ingleson |
| | C - Systems Protection | Tony Seegers |
| | D - Line Protection | Roger Hedding |
| | K - Substation Protection | Charlie Sufana |
| | H - Relaying Communications | Ken Fodero |
| | J - Rotating Machinery | Steve Conrad |
| VII. | Presentations | Miriam Sanders |
| | Breaker Failure Protection for Power Circuit Breakers | Roger Hedding |
| | EMTP Reference Models for Transmission Line Relay Testing (WG D10) | Kalyan Mustaphi |
| VIII. | CIGRE Business Meeting | Ivan de Mesmaeker |
| IX. | Advisory Group Reports | Paul Hindle |
| | AG1 - Substation Automation | Jorge Filho |
| | AG2 - Protection of Main Plant & Circuits | Moh Sachdev |
| | AG3 - Monitoring, Metering & Overall Protection | Gonzalez Amantegui |
| | AG4 - Asset and Information Management | Frank Koers |
| X. | IX. Adjourn | |

Call to order / introductions**Winston**

Chairman Phil Winston called the meeting to order at 8:00 am.

Approval of Minutes – September meeting and misc.**Sanders**

The minutes of the Columbus May 23-26, 2005 were approved. A brief financial summary was given. Our treasury is about \$17,000, with this meeting resulting in a deficit of \$1500.

Chairman's Report**Winston**

Chair's Report September 2005

This joint meeting with our CIGRE colleagues has been and will continue over the next few days to be jointly beneficial to the PSRC and CIGRE. The CIGRE participants have brought a refreshing addition to the PSRC meetings that they have attended and I hope the reciprocal effect has been evidenced also. All of those involved in the arrangements for this meeting are to be congratulated for their efforts.

Obviously our next meeting in January 2006 is on many peoples mind. The recent events in New Orleans have obviously placed this meeting in jeopardy. The Officers will be reviewing the situation over the next 30-45 days and will be communicating a decision at that time. Although we obviously want to support the efforts of the city to recover from this catastrophic event, our focus is obviously on ensuring that the meeting go forward as scheduled only if the city and the hotel can assure our attendees a full New Orleans experience

Technical Paper Coordinator's Report**Henville**

Technical Paper Coordinator Report. 14th September 2005.

Due to the devastation of the Hurricane Katrina in New Orleans, the IEEE PES T&D show that was scheduled to be held in there in October of 2005 has had to be postponed to the Spring of 2006. The rescheduled venue and dates are to be announced within the next few weeks. The PES will keep all participants informed of the change in plans and update them as soon as possible. Two PSRC panel sessions, one led by Mark Adamiak, and the other by Ken Martin, as well as several PSRC sponsored papers were to have been presented there.

The IEEE PES 2005 Annual meeting in San Francisco in June had good participation by the PSRC. There were three presentation sessions and several papers in a poster session. Thanks very much to the Session chairs Jim Ingleson and Gustavo Brunello, and also to Alex Apostolov who stepped in with only a few hours notice to chair the third session that the scheduled chair was unable to attend due to a sudden illness. However the number of no shows for the poster sessions was a disappointment. Approximately 40% of the poster session authors were no shows.

The call for papers for the IEEE PES 2006 General Meeting in Montreal Quebec has been posted on the PES website. The manuscript submission site will open about 21 October, and close on 5th December, 2005. For this meeting, it is hoped that there will be some jointly sponsored sessions for high quality papers that span the interest of more than one technical committee. PSRC participants are encouraged to submit papers that could be presented to a wider audience than just relay engineers at jointly sponsored sessions. The present process for paper review is difficult due to a very short (usually two week maximum) time allowance for reviews. When the call for reviewers goes out please let Charlie Henville know of your willingness by return mail. Presently the call for reviewers goes out just to Subcommittee members (through the subcommittee chairs). However we are interested in as broad a number of reviewers as possible. Anyone who did not get a request to review papers in March of this year, and who would like to contribute their expertise, please contact Charlie Henville directly.

CIGRE Report**Cease**

The 2005 General Session will be held in Paris from August 27 to September 1, 2006. The preferential subjects for SC-B5 are as follows:

PS 1. Impact of IEC61850 on Protection and Automation

- Experiences of Utilities and Manufacturers
- Specification
- Migration strategies
- System integration and testing
- Procurement practices: Multi-vendor/ System integrator responsibilities
- Project execution: Implementation, Tools, and Commissioning
- Operation and Staff training

PS 2. Protection Systems and Substation Automation for Major disturbances

- New local protection and control approaches to minimize impact:
 - Actions to prevent cascade tripping,
 - Load shedding, islanding,
 - Autoreclosing
- Techniques for maintaining system integrity and security during large disturbances
 - Actions to maintain system stability
 - System Protection Schemes
 - Power restoration practices

The CIGRE Colloquium will be held this week following the PSRC meeting. Everyone is invited to attend.

The CIGRE SC-B5 / Preferential subjects are:

- Transformer protection, monitoring and control
- Specification & Evaluation of Substation Automation Systems
- Protection & Control of Series Compensated networks

Attached is the scope and mission statement of SC B5.

Attached is a listing of the Study Committees.

Attached is a listing of papers approved by the USNC for the Paris session.

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
D2 Systèmes d'information et télécommunications/Information Systems and Telecommunications

USNC Quota Approved Papers

Accepted	Group/PS	Allotment	Authors	Title
Yes	A1/PS 1	International	Swarn S. Kalsi , David Madura, Michael Ross, Michael Ingram (USA), Regine Belhomme, Pierre Bousseau, Jean-Yves Roger (France)	"Operating Experience of a Superconductor Dynamic Synchronous Condenser"
Yes	B2/PS 3	International	H.E. Dève, R. Clark, J. Stovall, R. Whapham, W. Quesnel (USA), S. Barrett (Canada)	"Field Testing of ACCR Conductor"
Yes	C2/PS 2	Italian	A. Bose (United States), S. Bruno, M. De Benedictis, M. La Scala (Italy)	"Emergency Control Assessment for Mitigating the Effects of Cascading Outages"
Yes	C4/PS 4	International	M. McGranaghan, M. Ingram (USA), M. Wasiluk-Hassa (Poland)	"Value Assessment for Advanced Transmission Power Quality Monitoring System"
Yes	B1/ PS 1	USNC	W. Zenger, B. Gregory (USA)	"Thermomechanical Design of XLPE Insulated HV and EHV Cables Installed in Duct and Pipe Systems"
Yes	B3/ PS 1; B5/PS 1; C1/PS 3	USNC	P. Myrda, E. A. Udren, D. Bates, D. Novosel (USA)	"Optimal Strategies for System-Wide Protection and Control Replacement Programs"
Yes	B4/ PS 2	USNC	Shalom Zelingher, Bruce Fardanesh, Edvina Uzunovic, Michael Parisi, Abdel-Aty Edris Joe H. Chow, Xia Jiang, and Xinghao Fang (USA)	"A Novel Operator Training Simulator for System Dispatch of Multi-Functional FACTS Controllers"
Yes	B5/ PS 1	USNC	Benton Vandiver Alexander Apostolov (USA)	"Testing of IEC 61850 Sampled Analog Values Based Functions"
Yes	C1/PS 1	USNC	Jinxiang Zhu, Henry Chao, Fangxing Li, Rana Mukerji, David Wang, Linda Brown (USA)	"Economic Assessment for Transmission Upgrades in a Deregulated Market"
Yes	C2/PS 2	USNC	E. Bajrektarevic, S. W. Kang, V. Kotecha, S. Kolluri , M. Nagle, S. Datta, M. Papic, J. Useldinger, P. C. Patro, L. Hopkins, D. Le, M.Y. Vaiman, M.M. Vaiman (USA)	"Identifying Optimal Remedial Actions for Mitigating Violations and Increasing Available Transfer Capability in Planning and Operations Environments"
Yes	C2/PS 3	USNC	R. Adapa, D. Douglass (USA)	"Applying Dynamic Thermal Ratings in System Operations"
Yes	C4/PS 3	USNC	J.C. Gomez (Argentina) , M.M. Morcos (USA)	"Inclusion of Sensitive Equipment Immunity in the Study of

				Overcurrent Protection for Transmission and Sub-Transmission Systems"
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PES Report

John McDonald

The IEEE PES Executive Committee will meet on Saturday and Sunday, November 19-20, 2005 in Dallas, Texas. Originally, the ExCom Meeting was to be held during the IEEE PES T&D Conference and Exposition in New Orleans on Sunday, October 9.

The rescheduled IEEE PES T&D Conference and Exposition will be held on May 22-24, 2006 in Dallas, Texas. PES is currently discussing with TXU the local hosting needs.

PES Contested Elections

The voting membership of the IEEE PES has the opportunity to elect our future leadership. The offices of President-Elect, Secretary and Treasurer for the period 2006-2007 will be decided. Two **candidates, nominated by the PES Nominations and Appointments Committee and approved by the** Governing Board, are contesting the President-Elect office (Saifur Rahman and Wanda Reder). The successful candidate for the office of President-Elect will subsequently serve as PES President for the period 2008-2009.

In the case of the Secretary and Treasurer, where an incumbent Secretary (Noel Schulz) or Treasurer (Al Rotz) has an excellent performance record in the position and it is judged that PES would benefit from service continuation to avoid the generally long learning time of a newly elected Secretary or Treasurer, the Nominations and Appointments Committee recommended, and the Governing Board concurred, the presentation of a single candidate (the incumbent) for both offices for a second two-year term.

In addition we also have three PES members (Peter Lips, Teddy Puttgen, Bill Kennedy) to consider for the IEEE Division VII Director position. Two of the candidates were recommended by PES (Peter Lips, Teddy Puttgen) and one is a petition candidate (Bill Kennedy).

Power System Basics for Non-Engineering Professionals Course

The one-day course was given last October during the IEEE PES Power System Conference and Exposition (PSCE) in New York, and again during the IEEE PES General Meeting in June in San Francisco. During discussions with the IEEE-USA to give the course in Washington, D.C. this Spring, we realized that we needed a short-form version of the course. There are situations where the attendees can't afford a full day of time away from work, which was the case in Washington, D.C. The ideal arrangements for a course in Washington, D.C. were a three-hour course, beginning late morning and going through early afternoon, with lunch provided. Steve Blume and Applied Professional Training (APT), the developer of the one-day course material, developed a short-form three-hour version of the course. IEEE PES and IEEE-USA sponsored the three-hour course that was given in Washington, D.C. on May 23.

The PES Governing Board continues to receive requests for this course to be taught worldwide at local PES Chapters and within electric utility and manufacturer organizations. PES put together a policy document on the use of the course material, and a budget template document for use by interested groups to prepare a budget for their course offering. The completed budgets for intended course offerings are sent to the PES Executive Office for review and approval of the budget parameters and choice of course instructor(s). PES can help find a course instructor also. The budget template document ensures that the host group considers every important parameter involved in offering the course, since the template has the input cells highlighted for all required parameters. In addition, the template has a completed example for the value of each parameter, and shows the net revenue for the course offering and the degree of revenue sharing, if any, with PES. Both the policy and budget template documents are posted on the PES web site.

Two groups have recently used the policy and budget template documents to have their course offerings approved by PES. The IEEE PES Malaysia Chapter will give the one-day course on July 12, using their own instructors, and Santee Cooper will host a number of Carolina electric utilities in a one-day course on July 21 using Steve Blume from APT as the instructor. Once the course is approved by PES, the following files are sent to the host organization for their course offering: Student Guide, Instructor Guide, Certificate of Completion form, Course Evaluation form, and a flyer to promote the local course offering.

The one-day course will be offered in 2006 during the IEEE PES Transmission and Distribution Conference and Exposition in May in Dallas, during the General Meeting in June in Montreal, and during the PSCE in October in

Atlanta. The challenge with every course offering is promotion of the course, since promotion is to lawyers, accountants, regulators, legislators, utility leaders who do not have the technical training they feel they need, and non-power engineers (e.g., civil and mechanical engineers, electrical engineers with little or no power background). Promotion activities for past PES meetings included giving five free seats to the top regulators locally, and then tell everyone else they would be there, which boosted attendance; giving the equivalent of Professional Development Hours/Continuing Education Units with the law society and the accountants; and purchasing the database from the American Bar Association (ABA) of their local members.

At the San Francisco General Meeting the Power Engineering Education Committee (PEEC) formed a new Subcommittee to manage and maintain this course material.

If your organization is interested in offering the one-day or three-hour versions of the course, please contact Bob Dent at the PES Executive Office (r.dent@ieee.org).

Expansion of IEEE Xplore Legacy Database

PES has initiated the expansion of PES legacy papers dating back to 1950 in the IEEE Xplore database. Under Phase I Transactions issues covering the period from 1968 through 1987 have been scanned, and metadata extraction began in June. Phase II will cover the remaining period from 1950 to 1967. PES is presently locating hardcopies of Transactions for this Phase II time period.

Upcoming Governing Board Meeting

The IEEE PES Governing Board will meet on Thursday, January 19, 2006 in Atlanta, Georgia.

2006 PES Meetings Activities

- The IEEE PES Transmission & Distribution Conference and Exposition will be held in Dallas on May 22-24.
- The 2006 IEEE PES General Meeting will be held in Montreal, Quebec, Canada on June 18-22.
- The 2006 IEEE PES T&D Latin America Conference and Exposition will be held in Caracas, Venezuela on August 14-18.
- The 2006 ESMO Conference will be held in Albuquerque, New Mexico on October 15-20.
- The 2006 IEEE PES Power System Conference and Exposition (PSCE) will be held in Atlanta, Georgia on October 29 - November 1.

EPRI Report

No written report at this meeting

Hughes

IEC Report

IEC TC 95 Measuring Relays

Udren

- 60255-27, *Product safety requirements for measuring relays and protection equipment.*
 - ◇ We have talked about the contents and impact of this standard for the years of its development – this is new to US utility users (but not to industrial users) of protective relays.
 - ◇ We circulated the Final Draft International Standard (FDIS) to US participants who accepted it; we had the US National Committee cast a favorable vote.
 - ◇ The FDIS was approved by a majority of voting nations and this will be issued as an IEC Standard.
 - ◇ The UK National Committee voted no, and submitted a long list of comments on problems they found. These needed to be pointed out in an earlier stage of development, so they probably won't show up in the published document. Some of these comments may point out or correct legitimate issues. They are being circulated to the US Technical Advisory Group (part of WG I4) that reviewed the document for their reference when they go to use the new Standard. Others wanting these comments should request them from eric.udren@kema.com. We are not posting IEC Standards drafts or materials directly on the PSRC web site.
- 60255-6, Electrical relays - Part 6: *General requirements for measuring relays and protection equipment.*
 - ◇ TC 95 has begun to revise 60255-6, a general relay standard parallel to parts of C37.90.0, last updated in 1988. At this time we have no volunteers from the US for participation.

- ◇ The IEC WG has issued its first draft revision that is being circulated to the TAG/WG 14 members for comments. Others with interest should contact eric.udren@kema.com for a copy. Comments are due in October. This should be viewed with the same importance and impact as a revision of IEEE C37.90, particularly by manufacturers.
- ◇ The Canadian National Committee is also looking at this draft, and may submit comments, even though they don't have a vote. We are sharing those comments and want to achieve coordination of observations. We note that Canada is a significant producer of protective relays, and brings a lot of expertise to our US WG over many years.
- Carried over from May - TC 95 needs to revise 60255-22-3 *Electrical disturbance tests for measuring relays and protection equipment - Radiated electromagnetic field disturbance tests*, last updated in 2000, and seeks WG members. The PSRC just finished updating C37.90.2 to get closer to IEC.

2. IEC TC 57 – Power Systems Management and Associated Information Exchange

- IEC 61850, *Communication Networks and Systems in Substations*
 - ◇ Products are having communications conformance tests at AEP Dolan Labs including GE, ABB, ZIV, others.
 - ◇ WG 10 has issued for comments a CD or Part 7-3: *Basic communication structure for substations and feeder equipment - Common data classes - Amendment 1: Clarifications and Corrections, and Extensions for Power Quality and Representation of Historical and Statistical Information*.
 - ◇ A draft update (Edition 2) of Part 9-2: *Specific Communication Service Mapping (SCSM) – Sampled values over ISO/IEC 8802-3* (Process Bus Mapping for Ethernet) is circulated for comments.
 - ◇ A New Work Item Proposal (NWIP) has been circulated for *Use of IEC 61850 for the communication between control centers and substations*. This is in line with TC 57 strategy to build a full suite of power system communications standards on the 61850 foundation.
- IEC 61970, *Energy management system application program interface (EMS API)*
 - ◇ FDIS has been issued for Part 1: *Guidelines and general requirements*. Contact eric.udren@kema.com for a copy.
 - ◇ This standard is being coordinated with 61850
 - ◇ There is a proposal for a new standard for automatic meter reading communications, IEC 61968-9: *Interface Standard for Meter Reading and Control* to be integrated with 61970, although 61850 is not mentioned in the NP document.
- TC 57 Strategic Policy Statement for discussion at their next general meeting – a copy is embedded in this report as posted on the PSRC Web Site.



"57_776e_INF TC57
SPS 0905.pdf"

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 12, 2005, in the Britannia room of the Westin 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 2005 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/ Follow: Balloting the Draft → Ballot Invitation → Requesting a Ballot Invitation
Join a balloting pool	http://standards.ieee.org/resources/development/ Follow: Balloting the Draft → Join and Existing Balloting Pool
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
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

Some Important Information

1. The Standards staff liaison position for the PES standards committees has been filled by two people in order to provide more comprehensive support. The Transformers and Stationary Battery Committees are assigned to Angela Ortiz. The Power System Relaying and other PES committees have been assigned Mr. Matthew Ceglia.
2. IEEE is tentatively planning for an editor to participate in the January PSRC meeting. The purpose of an editor participating is to review the editorial process as it applies to standards development.

Standards Coordination Effort

PARs applied for by all Committees of the Power Engineering Society (PES) are being circulated among the Standards Coordinators of the PES Committees. The number and title of each new PAR approved by the Standards Board is posted on the PSRC Web site at the following address.

<http://www.pes-psrc.org/AStandards.html>

The copy of each PAR can be viewed by clicking at the number of the PAR in the list. All members of the PSRC are requested to review the newly approved PARs. 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 2005 MEETING OF THE PSRC

The status of the standards approval activities, which have taken place since the May, 2005, meeting of the PSRC, is as follows.

1. Standards Published

C37.92 Standard for Analog Inputs to Protective Relays From Electronic Voltage and Current Transducers

PC37.114 Guide for Determining Fault Location on AC Transmission and Distribution Lines

2. Standards waiting to be Published

None

3. Standards reaffirmed

None

4. Standards withdrawn

None

5. Standards approved

None

6. Standards submitted for approval

PC37.90 Standard for Relays and Relay Systems Associated with Electric Power Apparatus

PC37.118 Standard for Synchrophasors for Power Systems

PC37.119 Guide for Breaker Failure Protection

PC57.13.3 Guide for Grounding of Instrument Transformer Secondary Circuits and Cases (after resolving negative ballots)

7. Standards to be submitted for approval

None

8. Standards Balloted

PC37.101 Guide for Generator Ground Protection

PC37.116 Guide For Protective Relay Application To Transmission-Line Series Capacitor Banks

9. Standards submitted for balloting

PC37.101 Guide for Generator Ground Protection

PC37.116 Guide For Protective Relay Application To Transmission-Line Series Capacitor Banks

10. Standards Recirculated

- PC37.118 Standard for Synchrophasors for Power Systems
- PC37.119 Guide for Breaker Failure Protection
- PC57.13.3 Guide for Grounding of Instrument Transformer Secondary Circuits and Cases (after resolving negative ballots)

11. Standards to be re-circulated

None

12. Standards to be submitted for Re-affirmation

- C37.96 Guide for AC Motor Protection
- C37.99 Guide for Protection of Shunt Capacitor Banks

The PARs approved since May, 2005, submitted, and the PARs for which extension has been applied are as follows. The PARs, which will expire in the near future, are also listed. Applications for extending the lives of these PARs should be filed soon.

13. New PARs applied for

- PC37.233 Guide For Power System Protection Testing
- PC37.234 Guide for Protective Relay Applications to Power System Buses
- PC37.235 Guide for the Application of Rogowski Coils used for Protective Relaying Purposes

14. New PARs approved

- PC37.111 Standard Common Format for Transient Data Exchange (COMTRADE) for Power Systems
- PC37.113 Guide for Protective Relay Applications of Transmission Lines
- PC37.233 Guide For Power System Protection Testing

15. PAR Extensions applied for

None

16. PAR Extensions approved

None

17. Modified PAR approved

None

18. Modified PAR submitted

None

19. PARs expiring in 2005

- PC37.105 Standard for Qualifying Class 1E Protective Relays and Auxiliaries for Nuclear Power Generating Stations
- PC37.109 Guide for the Protection of Shunt Reactors
- PC37.116 Guide for Protective Relay Application to Transmission-Line Series Capacitor

	Banks
PC37.119	Guide for Breaker Failure Protection of Power Circuit Breakers
PC57.13.1	Guide for Field Testing of Relaying Current Transformers
PC57.13.3	Guide for Grounding of Instrument Transformer Secondary Circuits and Cases (after resolving negative ballots)

1. SUBMITTAL DEADLINES & STANDARDS BOARD MEETING SCHEDULE

PAR/Std Submittal Deadline	Standards Board Meeting
February 4, 2005	March 20, 2005
April 29, 2005	June 9, 2005
August 12, 2005	September 22, 2005
October 17, 2005	December 7, 2005

Substation Committee Report

Evans

Substation Committee C Subcommittee Report

The Substations Committee Data Acquisition, Processing and Control Systems Subcommittee, Subcommittee C, met at the Substations Committee Annual Meeting in Tampa in April and a report from that meeting is available in the minutes of the May PSRC meeting. A full set of WG and TF meetings was scheduled for the PES General Meeting in San Francisco. However, Working Groups C1 and C2 did not meet. C3TF1, which is working on P-1615, made significant progress as well as the work on C37.1. C0 held a short meeting to discuss possible organization changes. That meeting was poorly attended and therefore no results were forthcoming.

Working Group C1 met jointly with PSRC at their September meeting.

The C Subcommittee planned to hold meetings for C3TF1 and C37.1 at the T&D Meeting, however that meeting has been postponed. We have no winter meeting plans in effect as of today but would entertain meeting with PSRC in January when their plans are known. We are also considering meeting at Distributech.

B: ADVISORY COMMITTEE

Chair: P.B. Winston

Vice Chair: C. Henville

B1: Awards and Technical Paper Recognition

Chair: F. Plumptre

Vice Chair: T. Sidhu

Attending the meeting on Monday September 8, 2005 were Frank Plumptre (chair), Tarlochan Sidhu, Rich Hunt, Mike McDonald, Wayne Hartman and Alex Apostolov

1./ Preparation for PES Awards, T. Sidhu agreed to spearhead this. Dead-line for awards is November 14.

POST MEETING NOTE all award requests submitted in time for Nov dead-line.

2./ The following awards to be handed out at the September PSRC meeting in Calgary

Description	Name		Type of Award	Applied	Handed Out
Awards and Recognition Chair	Hedding	Chair	Certificate of Appreciation	Aug-05	Sep-05
Substation Protection Subcommittee	Chano	Chair	Certificate of Appreciation	Aug-05	Sep-05
PSRC Report Understanding Microprocessor Based Technology Applied To Relays	M. Sachdev	Report	Certificate of Appreciation	Aug-05	Sep-05
PSRC Standards Coordinator	M. Sachdev	Chair	Certificate of Appreciation	Aug-05	Sep-05
C37.103 IEEE Guide For Differential & Polarizing Circuit Testing	M. Sachdev	Guide	Certificate of Appreciation	Aug-05	Sep-05

3./ Reminder: Subcommittee Vice chairs responsible for informing Awards and Recognition Committee of WGs that have completed their work so that awards can be issued in a timely fashion

4./ Suggestion: It would be worthwhile to have a brief job description for the Awards and Recognition Committee in particular the chair of that committee. Agreed by all attending the meeting. **POST MEETING NOTE** Draft job description sent to all members in Nov 05. To be reviewed further in Jan 06 PSRC Awards and Recognition meeting then, proposed for inclusion into PSRC O & P Manual.

B2: Fellows Awards

Chair: J.S. Thorp

The Fellows Committee met to review recent Fellows Nomination activity. Damir Novosel, the PSRC representative on the PES Committee reviewed the Committee's voting procedure and will send all of the PSRC Fellows suggestions on how to best present our nominees. We were also advised to study the list of PSRC Senior members to identify future Fellows candidates. We will require a meeting room at the next PSRC meeting

B3: Membership Committee

Chair: M.J. Swanson

Attendance during the PSRC meeting was near 220. This is near our record, but the CIGRE joint meeting helped increase our number.

17 new attendees were in our Newcomers Orientation meeting on Tuesday, which is considered a normal figure. I participated in the presentation.

No management support letters were written.

At Bill Kennedy's urging, there were 4 AltaLink engineers attending our meeting. No contact was made to the local University.

I wrote several small sections of the "About PSRC" page on our website. Charlie Henville is coordinating this effort. Some material has been submitted to Bill Lowe for mounting on the site.

We have made some modest progress in identifying PSRC personnel for secondary awards. Frank Plumtre has been a big help.

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

WG B5 met on Sept. 12, 2005 with 3 members and 2 guests in attendance. After introductions, the minutes of the May 2005 meeting were approved. 2003 and 2004 bibliography papers have been approved for publication in the IEEE Trans. on Power Delivery. Assignments were made to prepare the 2005 bibliography paper.

Publicity report will be prepared by Mal Swanson in consultation with Phil Winston. The Chairman will contact PSRC webmaster to explore the possibility of putting past relay bibliographies on PSRC website in a searchable form. Drs. Mani Venkata and Yuan Liao joined the working group.

B8: Long Range Planning

Chair: Rick Taylor

The task force met on Tuesday morning. The PSRC chair brought us up-to-date on the situation involving the effects of Hurricane Katrina on our January meeting scheduled for New Orleans. Rick Taylor will be in contact with the Monteleone Hotel to determine the capabilities of the hotel and the city to provide a safe, effective, and reasonably attractive location for our meeting.

The group then spent considerable time discussing the decline of the PES general meetings. Several suggestions were discussed that will be incorporated into a recommendation to John McDonald, the incoming president of PES [2006-2007]. The essence of the changes is to increase the influence of the technical committees in the administration and planning of PES and its meetings.

Rick Taylor has been asked by John McDonald to lead a task force to investigate institution of a "technical committee" meeting in the January/February time frame of each year. This meeting would be a stripped down version of the Winter Power Meeting with greatly reduced or eliminated administrative meetings.

B9: PSRC Web Site

Chair: Bill Lowe

There have been no major changes or problems to report about the PSRC Web site. Normal activities consisting of preparing pages for the new meeting location, posting routine and occasional files and news are the bulk of the activities. The only development has been on the "About PSRC" page which has been very slow. Charlie Henville has contributed several items for the "About PSRC" page and I have intentions of writing a few more items based on information in the O&P manual.

The IEEE L-Soft mailing list is up to date. There have been many people who have subscribed themselves. Addresses that bounce back are automatically removed from the list after a period of time.

I have had some thoughts about developing some tutorials for items such as "Accessing the IEEE L-Soft Subscribers Corner to manage your membership in the PSRC list and any other IEEE list", a tutorial for the officers showing how to log into the PSRC List management should the need ever arise, and perhaps some tutorials on general web activities that everyone should know and perhaps already does. Or any other how to's that could be documented.

I have helped the K subcommittee fix their main page. No other sub committees have solicited any help.

As I look at other web sites, many of them have a lot of information available from the main page. Our main page has the PSRC scope and the officers listed along with buttons to move you to the desired pages. A few people have suggested having more information available on the first page while others have commented on how nice our site looks. Are we okay as it is? Do we want a new look? These are some questions to ponder in the future.

C: SYSTEM PROTECTION SUBCOMMITTEE

Chair: T. Seegers

Vice Chair: R. Hunt

The System Protection Subcommittee met on September 13th, 2005 in Calgary, Alberta, Canada. 41 people attended the meeting, including 17 members.

10 WGs met at this meeting. WG C2 Protective Relaying and Power Quality will present their report at the January 2006 main committee meeting. C2 was thanked for their hard work and contributions

WG C9 Guide for underfrequency and Load Shedding submitted a motion by Alex Apostolov, seconded by Vahid Madani for permission to submit the guide to the main committee for the purpose of forming a balloting body and balloting

The C Subcommittee is urging all Working Groups to restate the Working Group assignment at the start of each meeting, and to place the assignment on the Working Group meeting agenda. In addition, the C Subcommittee plans to place the Working Group assignment, Working Group Chair and Vice-Chair information, and the status of the Working Group, on the PSRC website.

WG Reports:

C1: Cyber Security Issues for Relaying

Chairman:

Vice Chair:

Output:

Established:

Expected Completion Date:

The C1 working group met on September 12, 2005 with 9 members, 3 new member and 26 guests in attendance.

There was a discussion of the ongoing work of the working group. We plan to complete the paper by the September '06 meeting. Since this topic will be ever present and changing, it was suggested by the Chair that after the paper is complete the group should remain active as a working group to keep abreast of industry activity, review papers, guides, etc. from other entities for their pertinence to the PSRC. In its ongoing role, the group would only meet when there is business to discuss.

It was reported that we haven't received any input recently about the status of Substation C1's similar work on cyber security of SCADA.

Draft 1.8 of the paper was discussed and writing assignments were made for sections of the paper that are missing. Assignments are due to the chair before Christmas 2005.

C2: Power Quality Issues in Protective Devices

Chairman:

Vice Chair:

Output:

Established:

Expected Completion Date:

The C2 Working Group will present their report at the January 2006 Main Committee meeting. The Working Group has completed its work, and will disband.

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

Chairman:

Vice Chair:

Output:

Established:

Expected Completion Date:

Working Group C3 met Wednesday, September 12, 2005 in Calgary, OH in a single session with 5 members and 10 guests participating. One guest asked to become a member of the WG.

The group reviewed the open assignments from the last meeting. Status of those items:

- Section 4.2.2: Verifying the system model, WECC requirements for verifying the system model (Jon Sykes) - Jon will review this section and compare against the WECC requirements to see if anything is missing. Will not specifically refer to WECC. Alex has also written a paper - Jon Sykes will provide a copy of the paper for us to add to the list of references.
- Section 4.3:
 - The use of tools to simplify the relay setting process (e.g., autocalculation of taps in bank diffs, relay setting rules in short circuit/relay database programs), with suggestions to vendors (Alex Apostolov) - will see if his paper covers this.
 - Any legal requirements for retaining superseded relay settings/calculations (Art Buanno) - none discovered -- will be struck from paper
 - Any BC Hydro guidelines for retaining superseded relay settings/calculations (Frank Plumptre) - nothing received -- will be referred to but not specific
- Sections 1.0 Introduction, 2.0 Definitions, and 10.0 Conclusions and Recommendations will be developed (Steve Kunsman and Gary Kobet)

An editorial team made up of Ken Birt, Steven Kell, Don Lukach, Arif Cubucku, Hyder DoCarmo, Federico Lopez, and Gary Kobet will review the draft.

Timeline and milestones for completion:

First round editorial by October 15, 2005

WG member Ballot for approval by October 31, 2005

Comments from Ballot to Working Group by December 15, 2005

Next meeting in January, 2006 -- Final paper

Summary/transaction paper and presentation target 2006

The WG requests that the latest draft (version 4.1) be posted to the PSRC website. Gary Kobet will send this draft to Rich Hunt, vice-chair of C-SC by September 16.

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

Chairman:

Vice Chair:

Output:

Established:

Expected Completion Date:

WG C-4 met on September 13, in single session with 22 attendees (10 M, 12 G)

A brief background was provided for guest attendees and considering CIGRE members participating.

Stan Horowitz also mentioned that acronym SIPS introduced in the list of NERC acronyms. Vahid indicated that he had heard same from the NERC staff.

Methods of communicating the survey were also mentioned:

- CIGRE (Study committees B5 and C-2)

- EPRI
- PSRC
- NERC News latter
- Regional Council newsletters

The attendees reviewed the survey and discussed the content of questionnaire. Some clarifications were discussed and some WG members volunteered to review and make the necessary recommendations.

A spreadsheet, developed by WG member Stan Horowitz, was also reviewed.

The spreadsheet is intended to simplify the task of respondents for the questions that can be easily checked or selected. However, there are questions that require explanation and the respondents will need to write their responses.

The consensus from the WG members and attendees:

- We should pursue the web based survey development so that WG members can get a feel for the “radio button” and pull down features and verify the ease of filling out the on-line survey. If proved to be easy, then the spreadsheet will serve as a method that allows responses to be tabulated in preparation for the report to the SC.

Next step is to send the questioner and supporting Appendixes to the “C” subcommittee and the PSRC and the CIGRE, officers for comments, and in parallel work on the web based development for the January 2006 meeting.

C5: Deployment and use of Disturbance Recorders

Chairman:

Vice Chair:

Output:

Established:

Expected Completion Date:

A Meeting of the Working Group C5 was held September 12, 2005 in Calgary with 11 members and 16 guests in attendance.

Draft 11 was issued with comments received from draft 10 incorporated. The current draft does not include the Introduction, Purpose, Conclusion, or Annexes. Definitions of time synchronizing terms were discussed. There were two sections that were discussed and will be rewritten to clarify. The omitted sections will be added along with comments received from the meeting and posted on the C5 Working Group Website.

There was also a discussion of the terms used to define disturbance recording equipment. This issue is still open and will be continue via email prior to next meeting in January and is expected to be resolved by then.

C6: Relay Engineering in Power Engineering Curricula

Chairman:

Vice Chair:

Output:

Established:

Expected Completion Date:

The Working Group C-6 met on Tuesday, September 13, 2005, from 11:00am to 12:15 pm at Calgary, Canada. Six members and seven guests were present. Venkata chaired the meeting. The attendance list of the previous meeting held in Columbus, Ohio, was updated.

The primary agenda was to review and revise the latest version of the paper that included contributions from several authors of the paper. Detailed discussions took place on the entire outline and content. The latest

version is attached to these minutes. The group agreed to come up with the next version of the paper. They also agreed that it needed major revisions. The revised outline for the paper and persons responsible for each section are delineated below:

Section	Description	Responsible Authors
I	Introduction and Background	Phadke & Venkata
II	History Review of protective Devices	Peter McLaren
III	Importance of Protection for Industry	Novosel, Horowitz & Levorin
IV	Current Status of Protection Courses: Universities that offer protection courses	Thorp, Phadke & Sachdev
V	Utilities Training Programs and Adequacies	Wiedman, Bolder and Madani
VI	Background Materials and/or Pre-requisites	Girgis & Brahma
VII	Outline Modules of Course(s): 4xx/5xx	Phadke, Hunt & Madani
VIII	Future Directions for Teaching	Singh, Gers & De La Ree
IX	References (Bibliography)	All

C9: Under Frequency Load Shedding and Restoration

Chairman:

Vice Chair:

Output:

Established:

Expected Completion Date:

The working group met on Tuesday, September 13th, with 5 members and 3 guests present. Chairman Alex Apostolov reported that Rich Hunt had made all of the editorial changes, as suggested by the IEEE editorial review. Benton VanDiver converted drawings to TIFF format, per the IEEE paper style requirements. Alex initiated formation of a balloting body. When the balloting body is formed, the proposed guide will be sent out for ballot.

At the next meeting, we will hopefully have ballot results to discuss, comments to review, and possibly negative ballots to resolve.

C11: Guide for Protection System Testing

Chairman:

Vice Chair:

Output:

Established:

Expected Completion Date:

WG C-11 met on September 12 in single session with total 32 in attendance (12 M, 20 G)

Attendees included CIGRE members and Chairs of some of the subcommittees that WG C-11 is coordinating with.

WG members and guests were informed that PAR has been approved.

The WG members continued with the review of contributions, and several sections were reviewed and commented.

- Lines with Series Transformers
- Breaker Failure Protection Testing
- IEC 61850 Protection Testing
- Wide-Area Protection Schemes
- Generator Protection Testing

New topics and suggestions for extending descriptions on some sections were addressed. Some members volunteered to contribute and others to review and critique the Guide for improvements.

Below is a copy of the Assignment, Scope, Purpose and reason for the Guide as approved by WG members for the PAR:

Assignment: The working group will develop a guide for system application test requirements, scope and level of tests, and benefits for overall protective schemes. This assignment includes SPSs, end-to-end testing, data collection requirements, and the test procedure definitions.

Scope, Purpose, and Reason:

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

Reason:

This document will aid academic, manufacturing, application engineers and industry protection professionals with the overall benefits for protection scheme performance testing. The document will discuss benefits and challenges associated with verification of overall protection performance and will include information such as: a) Listing of type / production tests, b) Product performance tests from user view, c) Commissioning test - d) Relay settings are properly selected and calibrated e) Verify connections and calibration of settings, f) Trip/no trip and troubleshooting test

C12: Performance of Relaying During Stressed Conditions

Chairman:

Vice Chair:

Output:

Established:

Expected Completion Date:

The WG met on September 12, 2005 with 13 members and 21 guests present. Two guests expressed an interest in becoming WG members. This was the third meeting of the WG.

Tom Wiedman and Bill Kennedy briefly updated the group on the current and future activities of NERC relative to mitigating cascading outages, including the status of NERC recommendations relative to line loadability issues and Zone 3 relay settings. They indicated that a NERC standards authorization request is being prepared on Line Loadability.

The chairman reviewed progress made to date in developing the WG report. Significant progress has been made on sections related to description of the phenomena and protection related behavior under stressed conditions. Draft 2 of the report was reviewed and new assignments were made to address outstanding issues and to modify and simplify existing sections. Those who volunteered to work on sections of the report were

asked to submit their writing assignments by December 1st so that Draft 3 can be circulated before the January meeting.

C13: Undervoltage Load Shed

Chairman:

Vice Chair:

Output:

Established:

Expected Completion Date:

On Monday morning September 12, 2005, the UVLS Working Group met for the first time with 35 in attendance. This included 13 member (2 new) and 22 guests.

The working group assignment was discussed and was slightly redefined to be the following:

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

The scope was proposed to be the following:

This report presents information on implementing undervoltage load shedding schemes in electric power systems. It will provide much of the reference material necessary for a future guide on UVLS. The report will not cover other uses of undervoltage protection or the implementation of underfrequency load shedding except as it pertains to coordination issues.

No amendments to the scope were made at this time. The C Subcommittee has taken the assignment and scope under consideration and will determine whether further adjustments are necessary.

The contents of the report and outline were then discussed. This report will focus on undervoltage load shedding and exclude detailed discussion of other means of load shedding. Reactive and voltage management (like automatic voltage control and voltage reduction & LTC blocking) will be covered in the background. The relationship between voltage collapse and frequency decay will be discussed in the background as well.

The meeting included extended discussions on the content of the sections of UVLS philosophy, design, and local methods and voltage collapse detection. This report will emphasize that UVLS should be considered a last resort option rather than a normal planning solution for contingencies.

At the conclusion of the meeting, a request was issued for volunteers to make presentations on their UVLS schemes at the next meeting. Three volunteered at or shortly after the meeting to make presentations. It was agreed that the outline would be revised and re-circulated for comments prior to the next meeting.

Power System Analysis, Computing & Economics Committee

Liaison: Malcolm Swanson

No activities to report

NERC

Liaison: Phil Winston

The NERC System Protection Committee Task Force is moving forward on requirements for Zone 3 relays on transmission lines, review of "Beyond Zone 3" settings, and a review of the feasibility of undervoltage load shed schemes.

For Zone 3 settings, all mitigation must be complete by December 31st, 2005. Rejected exceptions must be mitigated by March 16th, 2006.

Beyond Zone 3 elements are load responsive relays connected on transmission lines operated at 200kV and above, and operationally significant lines operated at 100kV – 200kV. These include distance relays, overcurrent relays, out of step relays, and switch onto fault relays. The review status is due by June 30th, 2006, with mitigation to be complete by December 31st, 2007 for 200kV lines and above.

For more details, download the report from the NERC website at <http://www.nerc.com/~filez/spctf.html> , or <http://www.nerc.com>

- Committees
- Planning Committees
- SPCTF Related Files

IEEE PES Power System Stability Controls SC

Liaison: Gary Michel

No activities to report

D: LINE PROTECTION SUBCOMMITTEE

Chair: Roger Hedding

Vice Chair: Mike McDonald

The meeting was called to order by Chairman Roger Hedding on Tuesday September 13, 2005 at 3:00 p.m. There were 16 members and 30 guests in attendance.

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

Advisory Committee items of interest: A poll was taken to see how many members would not be attending the January meeting in New Orleans due to health/safety concerns if the hotel says it's open for business. Ten out of forty-two indicated they would not.

General items:

Each Working Group Chairman needs to see that an updated Working Group scope and membership list is sent to the Vice Chairman within two weeks.

Working Groups were reminded to bring 10 to 15 copies of meeting minutes/drafts/agenda regardless of whether this information is available on a website in order to have information available for guests.

It was noted that Bill Lowe is seeking assistance with web site maintenance. Anyone interested should contact Bill directly.

Working Group reports: (see attached document)

New Business:

None.

High Impedance Fault activity:

None reported.

The meeting was adjourned at 3:55 p.m.

D1: Cold Load Pickup Issues and Protection
Chair: Dean Miller
Vice Chair: Tony Sleva
Expected Completion Date: May 2006
Output: Report to the PSRC

The WG met on Monday afternoon, September 12, with 8 members and 8 guests present. Tony Napikoski has been unable to attend the PSRC meetings so Dean Miller has accepted the chairmanship for the working group and Anthony Sleva volunteered for the vice chair position. The uncompleted writing assignments were discussed. Pat Carroll presented his writing assignment for the working group report. The outline for the report was reviewed and some changes were made. A graph showing factors that influence the magnitude of the current on a feeder after an extended outage was discussed which lead to a discussion on regional differences in cold load pickup phenomena. The group will be working on a mythology for estimating the load level after an extended outage based on load characteristics. John Boyle will give a presentation on test results that TVA acquired from their field tests for cold load pickup characteristics.

The working group will meet in one session in January. We will need a room for 25 people with a computer projector.

D4: Application of Overreaching Distance Relays
Chair: Russ Patterson
Vice Chair: Walter McCannon
Output: Report to the PSRC

Working Group D4 met with 19 members and 39 guests, this included 5 attendees that became members. Total in attendance was 58. Don Lukach of Ameren gave a presentation on a sub-transmission case of a mis-operation of a scheme using load encroachment. This sparked a lively discussion about NERC SPCTF guidelines and industry use of load encroachment.

The point was made that load encroachment should be set with input from the planning engineers on maximum expected line loading.

The point was made that the figure eight characteristic with an offset mho has been used successfully in this application with excellent resistance to load encroachment.

The chairman asked Tom Wiedman to update his section of the paper pertaining to NERC requirements as the SPCTF work moved forward.

The following assignment was accepted:

- Rick Taylor, Frederico Lopez, Jack Fital and Roger Hedding agreed to be reviewers of the document.

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

The Working Group met in a double session with 44 attendees (19 members and 25 guests).

After introductions and approval of the May minutes, we continues to review and discuss the comments for Draft 2.0 of the document.

At the completion of the second session, we finished addressing the review comments and hope to make the necessary revisions to the document in the next 30 days. We are currently planning on Balloting the Guide before the January meeting and handling the ballot issues during the January meeting.

We request permission to ballot.

For the next meeting: double session, 40 people, no A/V.

D6: Power Swing and Out-of-Step Considerations on Transmission Lines
Chair: Mike McDonald
Vice Chair: Demetrios Tziouvaras
Output: Report to the PSRC

The WG did not meet. The Report has been approved by the Officers and has been placed on the PSRC website under 'Published Reports'. Having completed the assignment, the WG requests it be disbanded.

D7: Loss of AC Voltage Considerations
Chair: Elmo Price
Vice Chair: Russ Patterson
Output: Report to the PSRC

Working Group D7 met with 8 members and 4 guests. The chairman could not attend due to affects of hurricane Katrina so the vice chairman led the brief meeting and covered several items at the chairman's request.

The following assignments were accepted:

- | | |
|---------------------------|--|
| Ken Behrendt | <ul style="list-style-type: none">• Write a section on LOV and reclosing on hot line where there is a VT on each line-side phase but only using one phase (e.g. B-phase) for hot line check. In that case some may choose to check for zero sequence voltage to block reclose. |
| Don Lukach and Rich Young | <ul style="list-style-type: none">• Will review the edits provided on draft 4.0 by Russ Patterson and comment on their appropriateness. Also, will suggest other edits as appropriate. |
- Comment was made that the length to which polarizing methods are discussed may be too much. It needs to be reviewed to ensure it doesn't unnecessarily encumber the document.
 - The report layout was discussed with the consensus being that the report layout as it stands in draft 4.1 is fine. Comment was made that the title needs to indicate who the report will be to.

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

D8: Justifying Pilot Protection on Transmission Lines
Chair: Gary Kobet
Vice Chair: Bogdan Kasztenny
Output: Report to the PSRC

The WG met on Tuesday, September 13, 2005 in Calgary with 31 in attendance: 19 guests and 12 members. Three guests expressed a desire to become WG members. Total WG membership stands at 24.

The group reviewed the minutes of the May 2005 meeting, which were approved.

Most writing assignments were received in enough time for a first draft to be assembled, which had been e-mailed to the group on 9/5/2005. Most of the meeting was used to review the draft.

Several specific reviewing/writing assignments were made. Following are general items of interest:

- All comments raised during the meeting were incorporated into the document, and draft 1.1 developed.
- Draft 1.1 of the document will be posted to the PSRC website.
- Comments on draft 1.1 and additional writing assignments will be submitted to the chair/vice-chair by November 15 for incorporation into the document. Draft 2.0 will then be posted to the PSRC website by December 1, to be reviewed by the WG for the January 2005 meeting.

For the next meeting – aimed at reviewing draft 2.0 and any comments - the group kindly requests a single session with a computer projector and seating for 30 attendees.

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 Belaire Room at the Westin Hotel, Calgary, Alberta, Canada from 9:30 AM to 10:45 AM on Monday, September 12, 2005. Nineteen members and seventeen guests were present. Five guests joined the Working Group.

Mohindar reported that the PAR submitted to NesCom (New Standards Committee of the IEEE Standards Association) in March 2005 was approved at the June meeting of NesCom. He also reported that copies of the current guide were provided to the WG members soon after the May meeting of the WG.

Several reviews of clauses of the guide were received; seven reviews are outstanding. Twenty writing assignments were handed out. The outstanding reviews are due back by October 31, 2005 and the writing assignments are due on or before November 30, 2005.

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

Sept. meeting: single session, room for 40 persons and a computer projector.

DTF11: Effect of Distribution Automation on Relaying.

Chair: Fred Friend

The Task Force met on Tuesday, September 13, 2005 with 18 people in attendance.

There was a discussion on various automation schemes and the effect that technology improvements (especially microprocessors and communication devices) have on distribution automation. The utility representatives gave a brief overview of their use of distribution automation within their company.

It was decided by a consensus of the Task Force that another Task Force meeting should be conducted in January 2006 to present the distribution automation practices for AEP, DTE, NStar, WE Energies, and other utilities as time will permit. Eight of those in attendance indicated an interest in becoming a member if a working group is formed. Two additional people also expressed an interest in being a member but were unable to attend this session due to a conflict.

The following assignment was agreed upon by the Task Force: To prepare a special report the PSRC that describes the effect of Distribution Automation on relaying.

Single session, 30 people. Computer Projector. (avoid conflict with D1 and D5).

H: RELAY COMMUNICATIONS SUBCOMMITTEE

Chair: K. J. Fodero

Vice Chair: A. P. Apostolov

H2: PROTECTION USING SPREAD SPECTRUM COMMUNICATIONS

Chairman: Ken Behrendt

Vice Chair: Bill Lowe

Output:

Established: 2001

Expected Completion Date: 2003

Working Group H2 met in a single session on Tuesday, September 13th with 5 members and 3 guests.

Working Group Chairman, Ken Behrendt, reported that Phil Winston, Main Committee Chairman, approved the working group report, with some minor editorial and typographical changes. These changes were made to the report and sent to the working group along with a list of the changes made, and another summary paper document prepared by John Tengdin. The working group report will be posted on the PSRC web site.

The working group discussed the proposed summary paper written by John Tengdin. The paper contains a list of questions that people may ask about using spread spectrum radio for protective relaying, that are addressed and answered in the paper. The summary points out several examples of working systems, and also refers to the very informative appendix in the report. The summary concludes with an invitation to visit the PSRC web site to obtain a copy of the paper. A few minor editorial and typographical changes will be made to the summary paper, per working group suggestions.

John Tengdin suggested that the summary paper be submitted to industry journals, such as the IEEE Power and Energy, and the UTC Journal. It was agreed that the working group will request approval from the Main Committee to pursue publication of the summary paper.

The working group chair will prepare a 20 minute presentation for the January PSRC Main Committee Meeting. The power point presentation will be sent to the working group for their review and comments before the next meeting.

There is no need for another meeting because this completes our working group assignment.

H3: Project PC37.94a - Standard For N Times 64 Kilobit Per Second Optical Fiber Interfaces Between Teleprotection And Multiplexer Equipment - Amendment 1: Addition Of Alternate Interface Using Single-Mode Fiber

Chairman: Tom Dahlin

Vice Chair: Ken Behrendt

Output:

Established: 2005

Expected Completion Date: 2007

Working Group H3 met in a single session on Monday, September 12th with 10 members and 4 guests, including new member Torbjern Einerssen (ABB-Sweden).

After introductions, the discussion focused on the availability of suitable 1300 nm single-mode transmit and receive modules. The manufacturer of one prospective module changed the specifications, making it unusable for this application. In addition, the manufacturer, PD-LD, changed the parts spec without notifying existing customers. Previously, the PD-LD data sheet for their PLD-1315M specified an output power range of -27dBm to -14dBm (0 to 70C, at 100mA). They changed the spec to specify an output power range of -30dBm to -10.5dBm (0 to 70C, at 100mA). Chris Huntley pointed out that this now translates to -33dBm (to -13.5dBm) for a 0/100mA data signal for this application. The PLD-2317M receiver threshold sensitivity spec is -35dBm (as

before). This would leave a 2dB budget for circuit tolerances and optic losses, which is not acceptable for this standard.

Ken Fodero reported that an alternative device may be available from Luminent (sp?), that meets the proposed specs and is relatively inexpensive. This part is not pin for pin compatible with the PDL D device, but it is in a metal case, making it easier for it to meet interference requirements. It also has a substantially better temperature range. Ken Fodero will email the Luminent device spec, or a web site hyperlink, to the working group chairman.

Chris Huntley suggested that the existing standard, using multi-mode fiber is fine. He questioned the need to create an amendment for the single-mode fiber. If manufacturers wanted to create a single-mode version, as they already have, they can do it without an amendment to this standard.

The group discussed the need for an IED to IED application. The issue is that the existing standard is written for IED to Mux applications and should continue to be the primary application addressed by the standard. The main problem is that the standard relies on the Mux to supply the clocking. For IED to IED applications, one of the IEDs needs to provide clocking. If some vendors want to go from IED to IED, that's up to them, they will have to address the clocking in their IED.

Chairman Tom Dahlin passed out copies of a recently updated PD-LD device spec. The updated spec lists an alternate output power range of -27dBm to -14dBm (at 100mA) with a restricted temperature range of -20 to 55C. This temperature range would not meet some vendor's device temperature range requirements.

The group agreed that there needs to be at least two manufacturers of optical TX and RX devices that meet the power requirements at a reasonable expense. Consensus is that the standard should spec levels, not form factors or pinout configuration.

The group discussed the 2km distance listed in the existing spec. All agreed that the distance could be much greater than 2km with single-mode fiber, but that the IED to Mux application should not require a greater distance than 2km. Also, power levels with single-mode fiber may cause problems on some optical receivers with such short distances. We probably need to include a cautionary note in the amended standard, indicating that attenuators may be need with some vendor's devices. Users will need to calculate the optical budget to determine the maximum distance that can be achieved if they want to go farther than 2 km.

All agreed that an effort should be made to keep the amendment simple.

Chairman Tom Dahlin asked if anyone knew of any other single-mode device vendors that would be suitable for this application.

Ken Fodero suggested that we pursue a dual logo (IEEE and IEC) on the amended standard. He suggested that Tom Dahlin check with Ken Martin because he is pursuing a dual logo for the synchrophasor standard.

Dr. Juergen Holbach said that he had a list of questions from their communications expert at Seimens, who could not attend this meeting. He suggested that it would be better to wait for the next meeting when his expert could attend. He also asked if we could provide some time at the next meeting for their expert to make a presentation. All agreed that this could be done. Dr. Holbach was asked to search for any prospective European vendors who may have optical devices to meet the single-mode optical requirements.

Members of the working group are:

Ken Behrendt	kbehrendt@selinc.com
Tom Dahlin	tom.dahlin@rfelect.com
John W. Miller	jwmiller@southernco.com
Roger Ray	roger.ray@pulsartech.com
Mal Swanson	mjswanson@mindspring.com
Marc Benou	marcb@iniven.com
Bob Bratton	rebratton@tva.gov

Ken Fodero	ken_fodero@selinc.com
Mark Simon	mark.simon@exeloncorp.com
Dac-Phouc Bui	bui.dac-phouc@hydro.qc.ca
Torbjern Einerssen	Torbjern.einerssen@se.abb.com

Guests at this meeting include:

Dr. Juergen Holbach	juergen.holbach@siemens.com
J.C. Tan	jctan@shaw.ca
Brent Duncan	brent.duncan@siemens.com
Imran Rizvi	Imran.rizvi@siemens.com

The next meeting will consist of a single session. A room for 25, with a projector, screen and a power strip is needed.

H4: COMTRADE Issues
Chair: Ratan Das
Vice Chair: Amir Makki
Output: Recommended Practice
Expected Completion Date: 2005

The Working Group H4, met on September 12, 2005. Sixteen members and nine guests were present.

Minutes of the May 2005 meeting was approved. Chair informed the members and guests that PAR has been approved by IEEE NesCom in their June (2005) meeting.

Jeff Pond presented the finding of their assignment to the group and subsequently discussions were held about the assignment in detail – working group members and guests has to submit their written comments on the issue within fifteen days.

Many PSRC members have requested to move the time-slot from the present one at 8-00 AM on the first day due to conflicts. Chair is also requesting the same to attend the standard coordination meeting.

We will meet at the January 2006 meeting. We need a room for 40 people with a computer projector.

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

H5: Common Data Format for IEDs
Chair: L. Smith
Vice Chair: C. Brunner
Output: Recommended Practice
Expected Completion Date: 2005

See reports from working groups H5-A, B and C below.

H5-A: Common Format for IED Configuration Data
Chair: D. Weinbach
Vice Chair: Dac-Phuoc Bui, Hydro Quebec TransEnergie
Output: Recommended Practice
Expected Completion Date: 2005

The group reviewed the scope, and then briefly discussed the following questions from previous meetings. This generated some discussion about the following items, which will be addressed at the next meeting:

1. How are multiple settings groups handled?
Already addressed in 61850

2. If elements are disabled on loss of an input (for example, PT loss disabling distance elements), how/where is that handled?
Will be decided as part of our process
3. How are complete logical nodes enabled/disabled?
Already addressed in 61850
4. Are any of the parameters we are adding (angles for example) already part of the common data classes?
Most parameters should be
5. What security features will insure data integrity and prevent spoofing?
TC57 is addressing security of communication. Security is outside the scope of H5a
6. What version information will allow revision control and tracking?
There are version data objects in each logical node. H5a will review whether further version information is needed

For the next meeting, we will be distributing a list of logical node names, and asking members to identify any missing logical nodes that would be required by their application.

The following assignment is carried over from the previous meeting, but was more fully defined and agreed upon:

Using the spreadsheet that will be provided, attempt to map the settings of your devices to those provided in 61850, and identify missing settings and any questions/problems that arise.

Due Date: NOVEMBER 1, 2005

Submit to davidweinbach@basler.com via email

Assignments:

Note: The website will be used to distribute and share the following information.

Christophe-	will do the assignment for ABB relays.
Alex-	will do the assignment for AREVA relays.
Krish-	will do the assignment for NxtPhase
Veselin-	will do the assignment for SEL relays.
Juergen-	will do the assignment for Siemens
Hachidai-	will do the assignment for TMT&D relays.
Mark (not present)	will be asked to do the assignment for GE relays.

All vendors not present are welcome to do this assignment, as are All Utilities and any other interested parties.

Next meeting requirements: Room for 30, Computer Projector Required

H5-B: Common Format for IED Event Data

Chair: M. Adamiak

Vice Chair: K. Narendra

Output: Recommended Practice

Expected Completion Date: 2005

WG H5-b met on Tuesday with 26 attendees. A draft document containing functional requirements, basic data item definitions, a proposed XML schema, and a sample XML event file was handed out and discussed. Pierre Martin presented an overview of the concept of a Schema and reviewed the work he had done on a proposed schema for the event data file format. Specific discussions revolved around how to format the TimeStamp value in the XML file. The issue is that the TimeStamp used internally in IEC61850 is a 64 bit Second-of-Century and Fraction-of-Second value. While this format is concise and easy to sort, it needs to be run through a conversion algorithm in order to view the data in terms of a Date, Time, and Time Quality. The alternative discussion centered on using the "ASCII" representation of the time and date stamp directly. It was noted that most devices in existence today will be supplying the time and date stamp in an ASCII format. No conclusion

was reached at this meeting and discussion was shelved until next meeting. There was overall agreement that Time should be represented based on UTC and that an optional "Time Offset" field should be included in order to permit the viewer to see events with local times. It was noted that the concept of a Unique Utility Identification Code (UUIIC) was of interest in other areas of utility identification. The chairman will undertake the task of discussing the concept with NERC.

Discussion items next meeting will address the concept of "event type", how Payload data is defined and chosen, and how to map non-existent data types - such as quality - into legacy device events.

All attendees were asked to review the draft document and to collect requirements for the inclusion of payload data and event type categorization. Please submit any comments to the chairman.

Un-resolved Old Business

In addition to the event identification code, a discussion ensued as to how to record events such as a settings file upgrade or a relay firmware upgrade. It was identified that one mechanism was to use the file name of the data source in the event record. The issue with this implementation is that the file name is not always readily available in the upgraded relay. What was identified was that in 61850, if the firmware was updated, a "datachange" report could be made on the Version number data item in the device nameplate data (in the 61850 Logical Node 0). In relation to this, it was identified that a new data item, that of the setting file version number, needs to be added to the LNO name plate data. This should be entered as a TISSUE to TC57 - WG 10 (the chairman will undertake this task).

H5-C: Common Format for IED Sampled Data

Chair: Benton Vandiver

Vice Chair: Bob McFetridge

Output: Recommended Practice

Expected Completion Date: 2005

The working group met on Tuesday, September 13, 2005, with 10 members and 15 guests present following concurrent sessions with H5-a and H5-b. The meeting minutes from the May meeting in Columbus were reviewed and approved by the group.

A review of the report outline resulted in no changes. Draft #2 of the report was reviewed and discussed. Contributions to date were reviewed, these included the COMTRADE (1999) sampled data, types, and attributes in comparison to IEC61850 and PQDIF standards, and the mapping for data conversion and the relationships between PQDIF and COMTRADE (1999). Other contributions solicited from the last meeting were reaffirmed and new assignments for the summary section and data security issues were claimed by Stan Thompson and Bob Beresh respectively. A healthy discussion of the ideas concerning sampled data compatibility and what should be part of the report's recommendation resulted in two new issues of data integration (or combining files) and unique file identification. Both will be addressed in existing sections where appropriate and the entire group encouraged to document and forward their ideas for inclusion. All updates will be distributed to members & guests for comment, new and past writing assignments are due by November 30th for inclusion in the next draft.

The H5-c working group expects to meet again in concurrent sessions with H5-a and H5-b in a combined meeting requiring a room for 20 with PC projector and screen as part of the ongoing triple session.

H6: Application Of Substation Ethernet LAN Communication For Protection And Control

Chairman: John Burger

Vice Chairman: Charlie Sufana

Output: Special Report

Established: 1999

Expected Completion Date: 2003

The H6 Working Group met September 12, 2005, in Calgary, AB with 8 members and 18 guests in a single session. Chairman John Burger presided. The minutes of the May 2005 meeting were approved as printed.

John Burger indicated that the paper is now on the PSRC website.

Marco Janssen gave a short update on IEC 61850. He said all parts have been approved and published. Work is now starting to make corrections and to add section about power quality. There will be revisions on all parts. There are additional object models being developed for metering. He also indicated that Working Groups 17 (distributed generation) and 18 (hydro plants) have started to use IEC61850. Also TC88 (windpower) is starting to use IEC61850. He also indicated that two new sections are being added; one for the harmonization with CIM and the other to extend the communication between substations. Marco said that the website for Tissues may be found at <http://tissue.iec61850.com>.

John Burger indicated that the next User's Group executive meeting for the officers is scheduled for October 4, 2005.

Marco Janssen announced that CIGRE B5 WG-11 is preparing an overview of 61850 and may be available about October 2006.

The Working Group next discussed what should be done to develop a PowerPoint presentation of the paper that could be presented at regional conferences. The following assignments for the PowerPoint were made

Chapter

1. John Burger
2. Steve Kunsman
3. Marco Hanssen
4. John Burger
5. Etienne Fortin and possibly Mark Adamiak
6. Mark Adamiak?
7. Chris Huntley, Joe Gould, Dennis Holstein?, Herb Falk?
8. Joe Gould
9. Tony Clark?, Richard Schimmel?
10. John Burger
11. Juergen Holbach, Brent Duncan, Christoph Brunner?, Steve Kunsman
12. Not used
13. Not used

John Tengdin next gave a short overview of IEEE P1615 Recommended Practice for Network Communication in Electric Power Substations.

For the next meeting, single session with a computer projector for 25 people.

H8: FILE NAME CONVENTION

Chair: A. Makki

Vice Chair: E. Gunther

Established: 2003

Expected Completion Date:

The working group met on September 12, 2005 at the Westin Hotel in Calgary. There were six members and four guests present.

Preparing the H8 recommended practice document for submission to the standards committee was discussed.

Prior to the meeting Erich Gunther volunteered to put the File Naming Convention recommended practice document in IEEE standard format. Once complete the document will be reviewed by the group for comment before submission to the standards committee for comment.

Next Meeting: Room for twenty people.

H11: REVISION TO THE SYNCROPHASOR STANDARD

Chairman: K. Martin

Vice-Chairman: Dan Hamai

Established: 2000

Output: Revised Standard PC37.118

Expected Completion Date: 2003

Working group H11 met at 1:30 Monday, Sept 12, 2005, in a single session. 6 members and 8 guests attended the meeting.

Minutes for the May meeting were read and approved.

Ken Martin reviewed the balloting and current status of the standard. The original ballot that ended in April had 66 affirmative, 6 negative, and 2 abstention votes out of a balloting pool of 82 persons. This met the requirements of 75% return and 75% approval, so the standard passed. The standard was revised based on comments. The 6 negative balloters were contacted to try to resolve their concerns. 4 of the 6 agreed to change their ballots based on the changes that were made. The revised standard, version 7.0, was re-circulated in June. A number of the affirmative balloters re-cast affirmative ballots; most balloters did not re-ballot, including the 6 negative ballots. Since the original ballots hold unless a new ballot is cast, the standard again passed with the same percentages. Since there were no new negative ballots, the standard met all requirements for a successful passage, and it was submitted to RevCom for final approval. They will consider it at their meeting on Sept 21.

The working group discussed the transactions paper that was discussed in Jan. It was agreed the paper will:

Introduce and describe the standard

Discuss the differences between the current IEEE-1344 standard and this new one

Discuss steady-state and dynamic measurements under the standard

Summarize current applications and use that to point to articles listed in a bibliography.

The chair will prepare a draft outline of the paper and distribute it for approval and requesting writing assignments.

The working group will meet in Jan in a single session, need room for 20 people, and need a computer projector.

H14: Telecommunication Terms Used by Protection Engineers

Chairman: Roger Ray

Vice Chairman: Ray Young

Established: 2001

Output: Paper

Expected Completion Date: 2006

H14 met on Monday, September 12, 2005. Introductions were made.

There were 5 members and 3 guests present.

The glossary has been assembled into one document as draft 3 and we are continuing to work on eliminating duplicate definitions and those that are not needed by the Relay Engineer. We have made several

assignments for the next meeting. We did not get as far along as I thought we would and will still probably need at least 3 more sessions to complete the document.

Need a room for 10 people plus a computer projector.

Task Force Reports

HTF1: Teleprotection Review

Chairmen: Marc Benou

Established: 2003

Expected Completion Date: ?

Task Force HTF1 met for the second time Monday, September 12, 2005 in Calgary, Alberta, Canada in a single session with 21 in attendance, 10 members and 11 guests. Thirteen people have agreed to be members in the first two meetings.

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

An outline based on C37.93 was handed out as a starting point for discussion. The outline reminded a couple of members that an existing paper on digital teleprotection applications currently exists, "Digital Communications For Relay Protection". This started a discussion on what HTF1 should focus on. The main possibilities were: an application guide for digital teleprotection, a testing standards guide for digital teleprotection, or a combination of both. The consensus was that an applications guide would be the most useful. It was recommended that the potential guide contain a way to quantify, classify and compare schemes and their performance as well as methods to test the schemes by the user.

Ken Fodero offered to supply the link for the PSRC digital teleprotection application paper. Ken and Chris Huntley will forward a copy of the Cigré document "Protection using Telecommunications". Both documents will be sent to the task force.

A request was made for a new HTF1 vice-chair. Mark Allen volunteered.

A name change of the task force to "Digital Teleprotection Review" is requested.

Another session as a task force is required to determine the scope and outline of the group. After reviewing the PSRC and Cigré documents, the goal of HTF1 is to determine if an application guide is relevant and if so, to determine the level of inclusion of equipment and scheme testing. Discussion should also continue about comparing the strengths and weaknesses of different schemes. If the task force should determine the existing documents adequate, a change of scope will be considered. A room for 30 people in a single session is requested for the next meeting.

HTF2 Broadband Communications over Power Line Carrier

Co-Chairmen: Veselin Skendic and Mark Simon

Established: 2003

Expected Completion Date: ?

Group met on Tuesday with 16 members.

Meeting agenda:

1. Presentation on the OPERA Project by Fernando Cobelo
2. Overview of the IEEE BPLC activities by Veselin Skendzic
 - a. P1675
 - b. P1775
 - c. P1901
3. Presentation on the Motorola LV BPLC system by Mark Adamiak

4. Report on the IEEE P1775 activities by Mark Simon
5. Discussion

Mark Adamiak proposed that the Taskforce be converted into a working group, which would put together "Best Use Scenarios". WG would provide feedback to the ongoing IEEE standards groups.

Projected needs for the next meeting: 20 attendees, with Computer Projector

HTF3: Comparison of Teleprotection Standards

Chairman: Mark Simon

Established: 2005

Expected Completion Date: ?

Scope:

Develop a compilation of differences and similarities of IEEE and IEC telecommunications standards, guides and recommended practices. The output will be in the form of a working group report and will be published on the PSRC web site.

Notes:

The group discussed the various world standard organizations and determined that the best and most timely product would come from limiting study to the IEEE and IEC standards.

The top level categories to be reviewed are:

- Environmental
- Performance
- Applications
- Communication Protocols
- Testing
- Cyber Security

Further broken down, the initial subject matter to be considered:

Environmental:

- SWC/FT
- Hi-Pot
- RFI – Susceptability
- ESD
- Temperature
- Voltage. Variations, range, ripple.
- Current consumption
- Impulse Noise
- Vibration
- Humidity
- Altitude
- Shock withstand
- Power interruption
- Contamination
- Salt fog
- Explosive atmosphere

Performance:

- Speed
- EMI (radiation and conducted)

Security / Dependability (as facets of reliability)

MTBF

Noise (analog/BER) rejection

Cross talk

Stability

Harmonics

Intermodulation

Capture effect

Ratings of contacts

Keying threshold and burden

Timing accuracy for sequence of events

Sync requirements

Alarm and diagnostic requirements

Output level

Impedance

Sensitivity

Image rejection

Bandwidth

Spacing

Performance of programmability

Applications:

Audio Tone Guide

Power Line Carrier Guide

Digital Guide?

Protocols:

C37.94

GOOSE 68150

ABB ? (Herman Spiess?)

Testing:

See performance. Each performance issue should have a related test.

Cyber Security:

IEC 62351 Security for TC57 items

HTF4: Understanding Microprocessor Based Technology Applied To Relaying

Chair: Mohindar Sachdev

Vice-Chair:

Established: 2005

Output: Assignment for a Working Group

Expected Completion Date: 2006

The second meeting of the Task Force was held at 09:30 AM on September 13, 2005 in the Banff Room, Westin Hotel, Calgary, Alberta, Canada. All members of the Task Force (five) and thirteen guests were present.

After introductions, the minutes of the Task Force meeting held in Columbus on May 25, 2005 were approved as distributed by Email.

Joe Gould made a presentation on the Communication Network Topologies. This was followed by a presentation by Fernando Cobelo on the Need for Communications in Protection. A presentation by Solveig Ward on Pilot Protection Communication Channel Requirements followed Mr. Cobelo's presentation. Brief discussions and inquiries followed each presentation.

The need for preparing a PSRC report on Understanding Communications Technology Applied to Relaying was discussed. All present at the meeting expressed the opinion that such a document would be very useful for

protection engineers. They unanimously voted for making a recommendation to the H Subcommittee that a Working Group be formed for preparing such a report. Eleven out of thirteen guests present at the meeting and all five members of the Task Force offered to join the new Working Group.

At the conclusion of these proceedings, the Chair thanked the participants and adjourned the meeting.

After the Chair presented his report at the Subcommittee meeting, the formation of the Working Group (to be identified as H-09) was approved for the purpose of preparing the proposed report.

Liaison Reports

1. Power System Communications Committee - E. A. Udren

No report at the meeting

2. Substation Committee - J. Tengdin

Work on IEEE P1615 "Recommended Practice for Network Communication in an Electric Power Substation" is now moving along rapidly. The 74 page draft 0.5 is available on the PES Substations web site under Working Group C3, Task Force C3 TF1. It now includes sections on substation noise sources and cabling recommendations for substation LANs. It may go to ballot in early 2006.

Work is also proceeding on the update of IEEE C37.1 with a new title "Standard for SCADA and Automation Systems." The latest draft (preuss_d1) is also available on the PES Substations web site.

Review by PSRC members of both documents is encouraged.

The C Subcommittee planned to hold meetings for C3TF1 and C37.1 at the T&D Meeting, but as we all know that meeting has been postponed. The Substations Committee has no winter meeting plans in effect as of today, but would entertain meeting with PSRC in January when your plans are known. We are also considering meeting at DistribuTech.

3. IEC TC57 Working Group 10 Report – A. P. Apostolov (in place of E. A. Udren)

1. IEC 61850, Communication Networks and Systems in Substations

- All parts of IEC 61850 are now approved international standards
- Working group 10 met with WG 17 and 18 for a Modeling Workshop in Baden Switzerland at the end of August 2005 to ensure harmonization of the models with the existing IEC 61850 models
- Joint WG 10, 17 and 18 meeting in Klaus, Austria the first week of September 2005
- Power Quality Models update to 7-4 amendment 1 (Basic Communications Structure – Compatible Logical Node Classes and Data Classes – Power Quality Additions) – CD comments resolved and document to be submitted to IEC.

2. Technical issues (Tissues) and amendments to all parts discussed and some of them resolved.

- #### **3. WG 17 on DR and 18 on Hydro applications – implementation of the Logical Device/Logical Node hierarchy in the development of domain specific models. Reuse of existing models for substation, protection, control and measurement models when possible.**

Coordination Reports

Old Business:

New Business:

I: RELAYING PRACTICES SUBCOMMITTEE

Chair: J. W. Ingleson

Vice-Chair: T. S. Sidhu

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

Past Chair: J.G. Gilbert

1. Introduction: The Relaying Practices Subcommittee (SC) met on May 25, 2005 in Columbus, Ohio. Introductions were made, and an attendance list was circulated. The recorded meeting attendance was 25 Subcommittee Members and 15 guests.

The following Subcommittee Members were present at this meeting: B. Anderson, O. Bolado, R. Beresh, J. Burnworth, M. Carpenter, R. Das, F. Friend, J. Gilbert, J. Holbach, J. Ingelson, L. Kojovic, M. Meisinger, G.P. Moskos, B. Mugalian, M. Nemier, D. Sevcik, T.S. Sidhu, M. Simon, V. Skendzic, L. Smith, M. Swanson, J. Tengdin, D. Weinbach, R. Whittaker, R. Young

Guests present at this meeting were as follows: J. Hackett, C. Brunner, T. Kase, L. Francois, A. Varghese, J. Pond, D. Fontana, A. Cerezo, D. Wilkerson, J. O'Brien, G. Santerre, T. Einersson, M. Allen, H. Ito, P. Winston

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

3. 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: Report

The Working Group I1, met on September 12, 2005. Three members and seven guests were present.

Minutes of the May 2005 meeting were approved. Discussions were held about one assignment on communications. Revised assignment is due by October end.

We will meet at the January 2006 meeting. We need a room for 20 people with a computer projector.

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

I2: Terminology Usage Review

Chair: M. J. Swanson

Vice-Chair: Barb Anderson

Output: Updates to IEEE 100: Standard Dictionary of Electrical and Electronic Terms

The I2 Working group met at 3:00 pm on Monday, September 12, 2005 with six members and one guest. The guest, Mark Schroeder, has joined the working group. Mal Swanson chaired the meeting. Minutes from the last meeting were approved.

The Working Group then reviewed assignments.

1. Work on C37.110 has been completed.
2. Terms from a review of C37.92 were discussed. Roger Whittaker will contact Chairman Udren for further clarification of "data valid signal" and "valid data signal". Roger will also discuss the definitions

section of this document with the Chairman. There were no new terms for the I2 working group to define.

3. Fred Friend gave several terms to Phil Waudby, Chairman of C37.230, to be addressed by that group. Fred will follow up with Irwin Hazenwinkle. The term, "adaptive relaying" has been previously defined by the I2 working group.
4. The term, "teleprotection," from C37.119, has been previously defined by the I2 working group. There were no new terms for the I2 working group to define.
5. Larry Lawhead is reviewing PC37.105.
6. Walt Elmore is reviewing C37.91.
7. Oscar Bolado will contact Frank Plumtre, Chairman of C37.116, regarding definitions from this document.
8. Mal Swanson will follow up on C37.113 (K1) and C37.111 (H4) for copies of these documents to review.
9. The term, "distribution automation" is not in the CD version of IEEE 100, nor is it in terms previously defined by the I2 working group. Barb Anderson will check C37.100.
10. The group discussed the problem of finding a liaison to C37.100, Standard Definitions for Power Switchgear. According to the PES website, this document was reaffirmed in 2001. Mal Swanson will contact Dave Stone to find a contact for C37.100. Barb Anderson will continue looking for the C37.100 Chairman and to find a contact on the Standards Board of IEEE.

The meeting was adjourned at 4:15 pm.

- I3: Microprocessor-based Protection Equipment Firmware Control**
Chair: R. Beresh
Vice-Chair: D. Weinbach
Output: Recommended Practice

The meeting commenced with introductions. There were 12 members and guests in attendance.

Draft 9 of the document was reviewed with no comments. A previous draft of the document was submitted for pre-ballot review. Outstanding items from the review and from the last Working Group meeting have been resolved except for several minor editorial changes. The final draft will be submitted for balloting as soon as possible.

- I4: IEC Standards Advisory**
Chair: E. A. Udren
Vice-Chair: M. M. Ranieri
Output: IEC Standards Advisory

The WG did not meet at the September 2005 meeting.

- 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 working group did not meet during the September 2005 meeting.

- 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)

The working group did not meet at the Calgary PSRC meeting.

- I7: Revision of C37.90.3, Electrostatic Discharge Testing for Protective Relays**

Chair: J. Teague
Vice-Chair: J.T. Tengdin
Output: New IEEE Standard C37.90.3

The group met on Monday with 24 members and guests.

PAR for this WG has been submitted and all comments resolved. Suggestion was to add in the guide title (air-core current sensor) so the title suggests that Rogowski coil is a current sensor for readers not familiar with Rogowski coils.

The new title is: **"Guide for the Application of Rogowski Coils (air-core current sensors) used for Protective Relaying Purposes"**

The initial Guide draft (Draft 0) document was developed and formatted according to the IEEE instructions. Discussion included the draft outline and further contributions.

I8: Revision of C37.90.1, Standard Surge Withstand Capability Test
Chair: J.G. Gilbert
Vice-Chair: J. Teague
Output: Revision of IEEE Standard C37.90.1-1989(R1994)

The WG I8 met in absence of the chair and co-chair with 7 members and 11 guests. The status of contributions to the guide was reviewed. Out of the 11 sections, input for two sections (section 4 and 10) was available and was presented. For many sections, the responsible contributors were not at the meeting due to overlaps with other working groups. Further input will be provided by December 15 and will be posted on the website.

The status of the different sections is as follows:

1. Status unclear
2. Status unclear; Peter McLaren will check with TW Cease
3. Andrew Klimek will supply input by December 15
4. Input available; some clauses need to be added
5. Input exists but was not available for the meeting. It was suggested, to include redundancy considerations in that clause
6. Nothing available
7. Nothing available
8. Andrew Klimek will supply input by December 15
9. Work is not assigned
10. Input available; some clauses need to be added
11. Input will be supplied by Ljubomir Kojovic the week of September 19

I9: Revision of C37.105 - Standard For Qualifying Class 1E Relays And Auxiliaries For Nuclear Power Plants
Chair: S. Mazumdar
Vice-Chair: S.M. Usman
Output: Revision of C37.105

There were 6 members and 3 guests in attendanc: Sahib Usman, Marie Nemier, Mario Ranieri, Jeff Burnworth, Roy Ball, Steve Kunsman, Sam Sambasivam, Jeff Gilbert and Imranali Rizvi.

A double session was held and the major items that were discussed are as follows:

1. Roy Ball was elected as the vice chair which was vacant after Sahib Usman agreed to become the chair of the working group.
2. A change of chair form will be completed and sent to the IEEE by Sahib Usman.
3. A PAR extension form will be completed and sent to the IEEE by Sahib Usman.
4. The comments received from the negative ballots were compiled and sorted. Comment resolution was started and assignments were made to the working group members.

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

Chair: M. Nemier
Vice-Chair: M. Bajpai
Output: Revision of IEEE Standard C37.98

There were 4 members in attendance: Marie Nemier, Mario Ranieri, Jeff Burnworth and Roy Ball

A double session was held and the major items that were discussed are as follows:

1. Draft 4 shall be prepared to send to correspondence members for review.
2. Prior to issuing draft 4, the definition section shall be compared to IEEE 100 for duplication.
3. Tif files for the figures and Annex A shall be inserted into the main document file.
4. The introduction shall be updated to provide details of the changes made from the previous revision.

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)

Working Group I12 met on the afternoon of September 12th with 4 members and 3 guest. At the September 12th meeting the remaining comments received in the balloting process were reviewed, discussed and changes were incorporated. Al Darlington has agreed to help redraw Annex figures to current Standards Format. The revised document will be submitted as Draft 8 for a recirculation ballot. The chair will request a PAR extension.

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 Working Group I13, Revision of C57.13.3 - Guide for Grounding of Instrument Transformer Secondary Circuits and Cases, met in Eau Claire North Room, Westin Hotel, Calgary, AB, Canada on September 13, 2005. Four members and two guests were present.

The presentation of the guide to the PSRC Main Committee at the May meeting in Columbus received many positive comments. A copy of this presentation has been posted on the PSRC website under the "I" Subcommittee.

The working group discussed changes based on negative ballots received from the 2nd recirculation of draft 9 of the guide. One balloter's suggestion was to include core balance and GIS transformer applications in the guide. The working group decided that these applications will not be covered in the guide. A reference to application of those devices will be included in the guide. The chair submitted the final version of the guide to the Standards Association with all correspondence regarding negative ballots and their resolutions.

The summary paper will be submitted for publication in IEEE Transactions on Power Delivery. An abstract of the paper will be submitted for publication in Power and Energy magazine. The paper will be submitted later for presentation at various protection conferences.

The working group will plan to meet in January 2006. If NESCOM approves the submitted final version of the guide, the group will not plan to meet.

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

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

Output: Revision of IEEE C37.110-1996

The working group met with 4 members and 8 guests. Draft 7 was distributed and discussed. Draft 7 was sent to the IEEE-SA for pre-ballot review on September 9th. It is anticipated that the request for formation of the balloting group will start in early November.

I17: Trends in Relay Performance
Chair: W.M. Carpenter
Vice-Chair: J.D. Wardlow
Output: Special Report

Working Group I17 met on September 13, 2005 with 3 members and 18 guests. Presentation of company results were made to the group. There was also a discussion pointing out that the measuring methodology used is showing up in some of the NERC draft requirements on measuring protective relaying performance.

A number of CIGRE members were present. There is no common measuring methodology in CIGRE; however, several CIGRE companies discussed the way in which they measure relaying performance at their various companies.

I18: Harmonization of IEEE C37.90.2
Chair: J. Burnworth
Vice-Chair: W. Higinbotham
Output: Revision of C37.90.2

The working group has completed its assignment and has been disbanded.

4. Task Force Reports:

ITF1: Relay Service Letter Database
Chair: J.W. Ingleson

The database was last updated on November 14, 2002, and is available on the ITF1 area of the SC web site.

ITF2: Event Reconstruction Using Data from Protection and Disturbance Recording IEDs
Chair: J. W. Ingleson

The second meeting took place at the September 2005 PSRC meeting.

High attendance at both meetings indicates high interest in this area. A draft outline was projected and was discussed. Assignments were made and are due in 30 days. i.e., due about October 13. The group has decided to take this effort in the direction of a discussion of supporting event reconstruction, that is, supporting compilation of sequence of events (SOE), using data from relay and recording IEDs. This is actually somewhat broader than the original assignment statement.

One issue identified was that internal delays in these 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. Jim Ingleson will prepare an overall report on the discussions so far. The initial output will be a report to PSRC.

5. New Member:

R. Whittaker was welcomed as a new SC member.

J: ROTATING MACHINERY PROTECTION SUBCOMMITTEE
Chair: S. P. Conrad
Vice Chair: W. G. Hartmann

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 # 8 - 9/13/2005

The Working Group met for a single session with 11 members and 3 guests on September 13, 2005. The Chair reviewed the activities to date for the group including a reminder of the writing and other assignments given during the January meeting. The Chair reported on the status of the Working Group including the partial draft report.

For the balance of the session the scope of the report and additional writing assignments were discussed and given. The Chairman expressed a desire to complete the report assignment by the end of 2006 in time for inclusion of the output into the anticipated new revision of C37.96. Writing assignments were given for all sections of the report and are due to the Chairman by November 15, 2005.

J3: Protection of Generators Interconnected with Distribution System

Chair: E. Fennell

Vice Chair: R. Pettigrew

Output: Transaction Paper

The Working Group (WG) did not meet. The WG transactions paper is completed and has been submitted to the PSRC Officers for review.

The WG will meet at the January PSRC meeting to make any changes that are required by the Officers. This meeting is contingent on the need to make changes to the paper.

J4: Revision of C37.102 AC Generator Protection Guide

WG J4

M. Yalla, Chair

K. Stephan, Vice-Chair

Established 2000

Output: Guide

Expected Completion Date: 2005

Status: 17th meeting

This meeting of Working Group J4, C37.102 IEEE Guide for AC Generator Protection was held on Monday, September 12, 2005, with 16 members and 15 guests in a double session.

Draft 7 of the guide was distributed which included changes to accommodate three of the negative ballots as discussed in the May meeting as well as the affirmative ballot comments. Since the May meeting, three of the negative ballots have been resolved. Resolution of the fourth negative ballot is underway. 128 of the 170 ballot comments addressed in Draft 7 were reviewed at this meeting.

Major discussion points at this meeting included use of the P-Q diagram, negative sequence protection in terms of torsional resonance, under/over frequency protection and harmonization with C37.106 and IEC 34-3, the meaning of X_0/X_1 (which reactance to use), undervoltage protection of generators and the protection of machines vs. the preservation of the grid issues, and backup protection settings and determination of voltage under "Extreme Emergency" conditions. Writing assignments were given to clarify clauses on some of these topics to prepare the guide for recirculation, which is planned to occur in October.

J5: Generator Protection Setting Criteria

Chair: C.J. Mozina

Vice Chair: M. Reichard

Output: Paper

1. Introductions, 15members, 16 guests. Mike Reichard chaired the meeting.
2. Review of Progress Since Columbus Meeting
 - a) Balloting and verbal comments received from the Columbus Meeting were incorporated into the Calgary draft of the paper.
 - b) References were updated to reflect latest information on NERC activities related to coordinating generator protection and control.
 - c) All but one comment from the negative ballot was incorporated into the paper.
3. WG discussed Comment #15 by the So. Co. group, Terry Crawley, Therron, and Tom Higgins. Issue concerns Section VI setting range of 150-200% of rated MVA at rated power factor and So. Co.'s request that the setting recommendation be changed to include 130%. The WG consensus was that the present reading not be changed. Further, it was requested that So. Co. be contacted to explain their request. Terry Crawley and Therron Wingard could not be reached. Tom Higgins was contacted and had Jonny Carlisle of their relay group provide clarification. Mr. Carlisle explained that the So.Co. settings were 130% rated MVA at relay MTA, not rated pf. A setting of 130% rated MVA @ relay MTA with $MTA = 75^\circ$ and $pf = 0.85$ ($\angle 31.8^\circ$) translates to a reach of 130% rated MVA / $\cos(75-31.8)$ @ rated pf, or 178.3% rated MVA @ rated pf. Which falls within the 150-200% guideline.
4. The following recommendations were made for section VI:
 - a) Implement So.Co. comment #17
 - b) Page 10, right column, sentence "System voltage under emergency conditions can reduce to planned levels of 92 to 94percent of nominal ratings", change to sentence "System voltage under emergency conditions can reduce to planned levels substantially below 1 per unit."
 - c) Page 10, right column, after above, add:
 4. Zone 1 settings: The example that follows uses a backup for faults in a zone that includes the first transmission line segment. Another commonly used approach is to apply Zone 1 as a backup to the generator buswork and GSU, typically set for 50% to 80% of the GSU impedance with a shorter delay.
 - d) Page 10, right column, third paragraph, change " Stability studies maybe" to "Stability studies may be".
 - e) Page 10, right column, Zone 2 criteria, add: Mike Thompson to include time delay for Zone 2.

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

Working Group J7, met on September 12, 2005 in one session with 8 members and 8 guests.

Draft 9 has been in the balloting process. The Chair reviewed the status of the official ballot.

- 101 eligible voters
- Ballot opened on August 19, 2005
- Ballot will close September 28, 2005
- Response of 51 of the 101 eligible voters were received so far:
- 13 disapproved wit comments (majority of negative comments were questionable as they were minor or editorial)

As soon as the comments are resolved, draft 10 will be recirculated.

JTF2: Protection Considerations for Combustion Gas Turbine Static Starting

Mike Reichard, Chair

Output: Report to the Subcommittee

The task force met on September 13, 2005 with 9 members and 2 guests. The task force developed a Scope:

Scope: Deliver a report or paper on special protection requirements on generators employing load commutating inverter (LCI) static starting. This will address operational effects on instrument transformers and protection element application, functionality, and accuracy.

The task force will investigate the aspects of static starting to determine whether there is a need for a working group. The first step in this process will be to invite manufacturers of LCI static starting products to give presentations to the task force. Zeeky Bukhala will provide a presentation on GE's product during the January 2006 meeting. The task force plans to invite a Siemens representative to provide a presentation at the May 2006 meeting. Wayne Hartmann and Tom Beckwith will contact Siemens' Juergen Holbach. In addition, Wayne Hartmann will contact instrument transformer manufacturer ITI to ascertain performance at low frequency.

Liaison Reports

Electric Machinery Committee

No report.

C.J. Mozina

IAS I&CP Committee

No report

C.J. Mozina

Coordination Reports

**P408-NPEC, Standard Criteria for Class 1E Power Systems for Nuclear Power
Generating Stations**

No report.

R.V. Rebbapragada

Old Business

None

New Business

C37.96 will be submitted to IEEE Standards for reaffirmation by the Chair. A balloting pool will be formed and a WG may be formed in January 2006 based on the outcome of the ballot

Gary Korbet advised the SC that NERC has posted PRCs 019-1 and 024-1 pertaining to AVR and generation protection coordination. Link: www.nerc.com/filez/spctf.html

Dale Frederickson reported on two anomalies, one dealing with loss of excitation due to faulty lock out relays from operator abuse, and another due to generator differential tripping on intermittent CT secondary circuit grounding due to insulation failure from suspected mechanical vibration.

K: SUBSTATION PROTECTION SUBCOMMITTEE

Chair: C. R. Sufana

Vice Chair: F. P. Plumptre

The Subcommittee met Tuesday September 13, 2005, at Calgary, Alberta with 15 members and 22 guests attending. The minutes of the previous meeting in Columbus were approved.

ITEMS OF INTEREST FROM THE ADVISORY COMMITTEE MEETING:

Charlie Sufana reported:

1. Informal poll with ADCOM taken of those going to New Orleans if the hotel is up and running. 17 not going, 19 going, 3 undecided.
2. Important reminder, need to ask Main Committee for permission to Ballot documents that go through the 'My Ballot' procedure.
3. C37.99 Shunt Capacitor Bank guide needs to be reaffirmed
4. Let Vice Chair of Sub Committee know about all completed awards
5. Bill Lowe looking for help in maintaining our PSRC web page.

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: 2006

The Working Group K01, Protection of Transformers against Faults and Abnormal Conditions, met in Britannia Room, Westin Hotel, Calgary, Alberta, Canada at 11:00 AM on September 12, 2005. Thirteen members and twenty-six guests were present.

The minutes of the May 2005 meeting of the Working Group distributed via Email and posted on the WG Web site were approved. The Chair briefly outlined the progress made since the January 2005 meeting of the Working Group as contained in Draft 4 of the guide distributed via Email before the meeting.

The status of outstanding assignments and the need to complete them was discussed. It was agreed that all outstanding assignments will be submitted before November 15, 2005 so that Draft 5 is distributed well before the January 2006. This will be the last revision before the paper is balloted in the WG.

At the conclusion of this business the meeting was adjourned.

K2: Breaker Failure Protection

Chair: R.A. Hedding

Vice Chair: A. CHAUDHARY

Established, 2001

Output: ANSI C37.119

Expected Completion Date: 2006

Draft 3

K2 did not meet. The Guide is at the NESCOM 9/21/05 meeting. Should get approved.

We will not meet in January 2006.

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

Chair: B. Pickett

Vice Chair: T. Sidhu

Established, 2002

Output: Paper

Draft 7.3

The WG met today with 3 members and 2 guests in attendance. It was decided not to include material on transmission substations but concentrate on distribution substations. The vice-chair will contact and get information on outstanding assignments. Then, the members responsible for these assignments will be contacted to complete their work.

K5: Application Of Common Protective Functions In Multi-Function Relays

Chair: Simon Chano

Vice Chair: Dean Miller

The K5 WG met in a single session with 13 members and 15 guests in attendance, with a strong representation by CIGRE B5 members.

Two presentations were given regarding European practices in the application of Ancillary Protective Devices. The first presentation by Jaoa Afonso from REN's utility in Portugal described their approach and implementation of their line protection architecture using all integrated protection functions in main 1, main 2, and system 3 IED's. Auto reclosing, synch check features including 50BR, CT Supervision, Event Logs, Fault location, and recorders were also discussed in the presentation.

A similar presentation was also given by Dr. Florent Balasiu from Romania with detailed presentations of their functional integration. It was clear that the philosophies and implementation practice differed in both presentations.

Frank Plumtre discussed his writing assignment for section 2 of the outline and agreed to further supplement his write-up with application examples for the next meeting.

Many writing assignments will be discussed in the next meeting, and three presentations will also be given in January 2006.

**K6: Sudden Pressure Relaying
Chair: Randy Crellin
Vice Chair: William Gordon**

The task force met on Monday morning, September 12, 2005 for the second time in a single session with 4 members and 8 guests. 4 of the guests were upgraded to members of the WG. By the end of the meeting, the task force currently has 13 members.

After introductions and review of the first meeting, it was decided to proceed with "A Technical report To the Substation Protection subcommittee on the application of Sudden Pressure Relaying in Power Transformers"

The idea of conducting a utility survey of sudden pressure practices, as identified in the last meeting, was postponed indefinitely.

The preliminary document was developed and writing assignments were given. The dead line for th writing assignments is November 28, 2005.

The KTF6 task force would like to request approval from the Substation Subcommittee to change the status of the WG form a task force to a working group with the following assignment:

To complete a technical report to the Substations Subcommittee on the Application of Sudden Pressure Relaying In Power Transformers.

**K7: Guide For The Protection Of Shunt Reactors.
Chair: K. A. Stephan
Vice Chair: P. G. Mysore
Established, 1999
Output: Revision of ANSI/IEEE C37.109
Expected Completion date: 2004
Status: Reviewing Draft 13**

The Working Group met on Monday, September 12, 2005, in one session with 2 members and 3 guests. Portions of Draft 13 of the guide were reviewed. One of the three negative ballots has been resolved since the May meeting. Draft 13 included this resolution as well as the proposed corrections for the other two negative

ballots. It is hoped that the negative ballot issues will be resolved after contacting the balloters. Draft 13 hopefully will be issued as the recirculation draft.

Discussion points included new figures for high-impedance phase and ground differential protection, DC offset effects on turn-to-turn fault protection, resolution on device 32Q, use of lockout relays and reclose blocking, and negative sequence protection for oil-immersed reactors and for open reactor winding protection.

K9 Arc Flash Work Group

Chairman:

Vice Chair:

Output:

Established:

Expected Completion Date:

Roger Hedding presided as vice-chair. Two members and twelve guests were present.

Following introductions, the group reviewed the Work Group assignment - no comments or changes were made.

The group then reviewed minutes of the last meeting – again, no comments or changes.

The group discussed and refined the outline. The following modifications were made:

- Added section that will summarize applicable standards (NEC, NFPA, IEEE).
- Added details to the “Non-Protection Methods” section, including
 - Arc tolerant switchgear
 - Current limiting fuses
 - System design modifications, including increase power transformer impedance, addition of phase reactors and faster operating breakers.
- Eliminated the “Impact of Arc Flash on Protection” section, information from which will be combined with the “Protection Tools to Reduce Impact of Arc Flash” section.
- Added a bibliography section at the end of the paper.

There was a lengthy discussion during the outline review of industry approach, experience and expertise with this topic, whereas utility personnel (relay folks in particular) have limited knowledge or experience with this subject.

Writing assignments were made as noted on the outline. In addition, two additional action items from the meeting:

1. Roger Hedding will forward an updated outline to the working group members.
2. Gerald Johnson will supply a list of Arc Flash references – to be sent directly to Karl Zimmerman.

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 September 12, 2005, with 5-members and 1-guest. I updated the group on progress of the active 1547 working groups based on the August 1 through 5, 2005 meetings in Arlington VA. 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 Koepfing, Chair; Tom Basso, Secretary

There are presently no outstanding protection issues requiring interface with the IEEE/PSRC. The working group agreed unless we have a scheduled presentation on local application of IEEE 1547 2003, or a protection issue from the 1547 working groups occur, K10 will not meet. However, we are planning on a presentation from Frank Plumtre of BC Hydro at the January meeting. If anyone else is interested in providing a short presentation on their DG experiences please let me know.

K13 (PC 37.116): Guide For Protective Relay Application Of Transmission-Line Series Capacitor_Banks.
Chair: F. P. Plumtre
Vice Chair: Dan Hamai
Established, 1999
Output: Guide for the application of protection on transmission series capacitor banks
Expected Completion Date: 2005
Draft 8

WG Met on September 12 in a single session with approximately 4 WG members and 5 guests in attendance. Discussion with WG Members, agreed to take out references in the document to software copies of unbalance calculations on the PSRC web site. This is to ease publishing constraints.

As an alternative, Dan and Frank Plumtre agreed to post spreadsheets to PSRC website as stand alone doc's referencing the Guide when it is published.

Expiration of PAR PC37.116 December 31/05 - PAR extension has been sent via Jeffrey Gilbert.

My Ballot Process closes September 15th for those wanting to be part of the ballot pool. Action by all WG members, please sign up prior to cut-off date. Remind K sub-committee members of cut-off date, to ensure their participation.

Some changes requested by IEEE Editorial board. Fairly routine editorial comments. Dan Hamai targeted to process these by end of September and send to Editorial Board.

Latest K13 Draft sent via e-mails to Mark McVey and Per Lindberg several months ago with our latest Draft. These individuals are representatives of T & D WG 824.

K14 Bus Protection Guide
Chairman:
Vice Chair:
Output:
Established:
Expected Completion Date:

The K14 Working Group met September 13, 2005, in Calgary, AB with 10 members and 14 guests in a single session. Vice-Chairman Steve Conrad presided. The minutes of the May 2005 meeting were approved as printed.

Steve gave a little insight of what has been happening off line. Bogdan Kasztenny has arranged several telephone conference calls. Steve indicated the minutes do reflect the two telecons that took place in August.

Damien Tholomier is working on clause 4. Damien has sent his work into Bogdan Kasztenny.

Jim O'Brien is working on clause 5.

Steve indicated there has been discussion on the detail of current transformers. At this point, the working group is holding the effort and may remove parts. Also there has been discussion on linear couplers; on hold for now. Stan Zocholl is looking into how to discuss the CT performance. The consensus seems to be to not have a CT tutorial.

Bogdan Kasztenny is going to work on breaker and disconnects.

Steve went through clause 7 assignments. Linear couplers may be removed but there are still systems that use them.

Clause 8 still needs writing assignments to be assigned. Voltage trip supervision seems to have some interest.

8.1 And 8.2 Zoran Gajic.

8.3 Check zone

8.4 Blind zones will be developed by Juergen Holbach.

8.6 (8.6.1 to 8.6.4) Partial differential Dominic Fontana will work on this.

8.6.3. 8.6.1 Greg Sessler

8.6.2 Don Lukach.

8.8 Sam Sambasivan and Juergen Holbach have volunteered.

8.9 Joe Uchiyama

8.11. Greg Sessler

8.12. Dominic Fontana

8.13. Juergen Holbach

8.14. Sam Sambasivan and Juergen Holbach

Gabriel Benmouyal wondered if cap banks should even be in the partial differential section. Steve explained that it is not suggested to use partial differential.

Steve also discussed the PAR. Bogdan Kasztenny is working on the schedule in the PAR as there had been some questions on the time table.

Everyone who has a writing assignment is to make sure they have a copy of the old version from K4. Writing assignments are due November 1, 2005.

The task force requested to be moved from a TF to a WG. The SC voted to approve this change, therefore WG-K14 is assigned.

For the next meeting, single session with a computer projector for 30 people.

Liaison Reports:

Tabled until next meeting

Old Business

None to report

New Business

Request for KTF9 Arc Flash Task Force to be made a work group. Approved, WG will be designated K9.

Request for KTF14 Bus Protection Guide Flash Task Force to be made a work group. Approved, WG will be designated K14.

Presentations:

Presentations of interest are always welcomed at the main committee. This meeting we had the pleasure of two such presentation.

Mr. Kalyan Mustaphi presented the output of WGD10, EMTP Reference Models for Transmission Line Relay Testing

Mr. Roger Hedding presented the Breaker Failure Relay Guide.

The presentations were well received and interesting. Thank you Kalyan and Roger for making our Main Committee meeting most interesting.

Future Meetings:

January 7-13, 2006 **New Orleans, LA**

May 5 – 18, 2006 **Albany, NY**

Sept 18 – 21, 2006 **Atlanta, GA**

January 2007 **Phoenix, AZ**

The meeting was turned over to Ivan de Mesmaeker of the Cigré group as the PSRC meeting was complete.