



POWER SYSTEM RELAYING COMMITTEE

OF THE

IEEE POWER ENGINEERING SOCIETY

MINUTES OF THE MEETING

Jan. 8 – 11, 2007

Scottsdale, AZ

FINAL

Power System Relaying Committee

Main Committee Meeting Agenda

Jan. 11, 2007

Scottsdale, AZ

7:30 AM– 11:30 AM

- I. Call to order / Introductions Charlie Henville
 - II. Approval of Minutes/Financial Report Bob Pettigrew
 - III. Reports of Interest Charlie Henville
 - A Technical Paper Coordinator's Report/Future Meetings Miriam Sanders
 - B PES Report- John McDonald
 - C CIGRE Report T. W. Cease
 - D UCA Report John Burger
 - E EPRI Report
 - F IEC Report Eric Udren
 - G Standard Coordinator's Report Jeff Gilbert
 - H Substation Committee Report Mike Dood
 - I Other Reports of Interest
 - IV. Awards/ Recognition Mike McDonald
 - V. Subcommittee Reports Charlie Henville
 - K - Substation Protection Frank Plumtree
 - H - Relaying Communications Alex Apostolov
 - C - Systems Protection Tony Seegers
 - D - Line Protection Roger Hedding
 - J - Rotating Machinery Wayne Hartman
 - I - Relaying Practices Tarlochan Sidu
 - VI. Old/New Business
 - VII. Presentations Bob Pettigrew
 - A Synchrophasors Ken Martin
 - B Relay Engineering in Power engineering Curricula SS Manny Venkata
(WG C6)
 - VIII. Adjourn Charlie Henville
- Appendix A: PSCC Minutes

Call to order / Introductions

Henville

Chairman Charlie Henville called the meeting to order at 7:35 am.

Approval of Minutes – September meeting and Misc.

Pettigrew

The minutes of the Atlanta Sept 2006 meeting were approved. A brief financial summary was given. Our treasury is about \$15,000. Salt River Project sponsored our Thursday morning coffee/food and we thank John Sykes for this.

We are investigating ideas for bringing the meetings back to revenue neutral vs. losing \$2000 on each meeting.

Chairman's Report

Henville

The Power System Relaying Committee has flourished under Past Chair Phil Winston's leadership. I am very grateful to him for his continuous and successful encouragement of all the Committee volunteers to continue to support and develop all the various activities in which we engage. These activities have enabled the PSRC to provide direction and advice to the electric power system business world wide in the area of protective relaying. The committee efforts have resulted in a status within the industry and the IEEE of which we can all be proud.

As incoming Chair I realize that it will be difficult to maintain the excellent level of leadership that Phil provided, but I am convinced that all the various working groups and subcommittees will continue their efforts to promote the reliable and efficient operation of electric power systems through technical documents, guides, standards and tutorials for which we are so widely respected.

I am particularly pleased to note the obvious expansion of our horizons to build relationships with other entities such as the Power Engineering Society, the Power Systems Communications Committee, the Substation Committee (Subcommittee C0), CIGRE Study Committee B5 and the North American Electric Reliability Corporation. I hope to encourage the mutual cooperation with other groups to lever the strengths of teamwork to the benefit of the power industry. The strengthened interaction will continue with the participation in "Supersessions" with other technical committees in the PES General Meeting in June 2007, and the PES joint technical committee meeting in January 2008.

At this meeting, I am pleased to note that our members continue to be acknowledged as significant contributors to the industry. Specifically, John Tengdin has been elevated to the IEEE member status of Fellow. A well deserved acknowledgement of his contributions to the IEEE.

I am also pleased to announce that because of their strong contributions to the work of the PSRC, several individuals have been invited (and accepted the invitation) to join the PSRC as member of the Main Committee. We welcome new members, Chris Huntley, Jeff Pond, Jim Hackett, Michael Thompson, Tom Wiedman, Prem Kumar, Hyder DoCarmo, and Walter McCannon.

Technical Paper Coordinator's Report

Sanders

Technical paper coordinator's report to January 2007 PSRC meeting.

Technical paper activity

Response from PSRC continues to be very encouraging. Sincere thanks to all those who offered to review papers especially all those who provided quick and careful review comments. The technical paper coordinator's work is helped enormously by your contributions. It is very encouraging to see the support from PSRC attendees to help keep high quality in PSRC sponsored papers.

45 papers were proposed for the 2007 General meeting in Tampa, and the revision process is presently under way. The PSRC will be having an unusually high level of participation in this meeting. Phil Winston will be chairing a Super Session on "Walking Closer to the Edge". This session will be jointly sponsored with several other technical committees. Two or three PSRC working group papers will be presented at this meeting.

Would anyone interested in chairing a PSRC paper session at the 2006 General meeting please contact me after the meeting and by email to confirm their interest and availability. The meeting will be from 24th to 28th June.

The two PSRC sponsored panel sessions at the October 2006 Power Systems Conference and Exhibition in Atlanta were very well prepared and presented. Fortunately what the attendance at these sessions lacked in quantity, was more than compensated by the quality of the participation. Thanks to Mark Carpenter and Eric Udren for leading those panel sessions so capably.

Future meetings

The Spring 2008 meeting will be held from 12 -14 May 2008, at the Kansas City Marriott Country Club Plaza in Kansas City Missouri.

CIGRE B5 Activities Report

Cease

The 2007 Colloquium will be held in Madrid Spain October 15-20, 2007. The preferential subjects for the colloquium are:

- PS-1 New trends in busbar protection
- PS-2 Acceptable Functional Integration in Substation P&C of Transmission System Protection
- PS-3 Protection of Transmission Lines & Co-ordination of Transmission System Protection

There was a call for papers sent out earlier. Due to the Christmas vacations the due date for the synopsis submission has been moved back to January 31. The final paper due date is still May 31. Attached is the Bulletin #1 giving details of the Colloquium. The earlier call for paper asked that your synopsis be sent directly to Paul Hindle (Secretary of SC B5 paul.hindle@vectorpower.co.uk). You have 2 options you can send the synopsis directly to Paul with a copy to me or send it to me and I will forward to Paul.

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

Attached is the scope and mission statement of SC B5 and a listing of the Study Committees.

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

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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

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CIGRE Study Committees

- A1 Machines électriques tournantes/Rotating Electrical Machines
- A2 Transformateurs/Transformers
- A3 Equipement à haute tension/High Voltage Equipment
- B1 Câbles isolés/Insulated Cables
- B2 Lignes aériennes/Overhead Lines
- B3 Postes/Substations
- B4 CCHT et électronique de puissance/HVDC and Power Electronics
- B5 Protection et automatisme/Protections and Automations
- C1 Développement et économie des réseaux/System Development and Economics
- C2 Conduite et exploitation des réseaux/System Control and Operation
- C3 Réseaux et environnement/System Environmental Performance
- C4 Performances techniques des réseaux/System Technical Performance
- C5 Marché de l'électricité et régulation/Electricity Markets and Regulation
- C6 Réseaux de distribution et production décentralisée/Distribution Systems and Dispersed Generation
- D1 Matériaux et technologies émergentes/Materials and Emerging Technologies

PES Report

John McDonald

No written report at this meeting

EPRI Report

Hughes

No written report at this meeting

IEC Report

Udren

1. IEC TC 95 Measuring Relays

- Maintenance cycle review program:

Publication number	Original publication date	New Title	Proposed target date for CD	Proposed target date for CDV	Proposed target date for FDIS	Date of publication as an IS
IEC 60255-22-1 Ed. 2	2005-03	Electrical relays and protection equipment- Part 22-1: Electrical disturbance tests - 1 MHz burst immunity tests		2006-09	2007-06	2007-12
IEC 60255-22-2 Ed. 2	1996-09	Electrical relays and protection equipment - Part 22-2: Electrical disturbance tests - Electrostatic discharge tests		2006-09	2007-09	2007-12
IEC 60255-22-4 Ed. 2	2002-04	Electrical relays and protection equipment - Part 22-4: Electrical disturbance tests - Electrical fast transient/burst immunity test		2006-09	2007-09	2007-12
IEC 60255-22-5 Ed. 1	2002-04	Electrical relays and protection equipment - Part 22-5: Electrical disturbance tests - Surge immunity test		2006-09	2007-09	2007-12
IEC 60255-11 Ed. 1	1979-01	Electrical relays and protection equipment - Part 11: Interruptions to and alternating component (ripple) in d.c. auxiliary energizing quantity of measuring relays	2007-02	2008-02	2009-02	2009-06
IEC 60255-26 Ed. 1	2004-08	Electrical relays and protection equipment - Part 26: Electromagnetic compatibility requirements		2006-09	2007-09	2007-12

- 60266-22-8 - 95/203/NP, *Power Frequency Magnetic Field Immunity Tests*
 - ◊ New project proposal from Japanese NC with draft from WG
 - ◊ USNC vote due by end of February.
 - ◊ Based on IEC 61000-4-8 generic immunity standard.
 - ◊ US members of Sector Board 1 said no – magnetic fields are not an issue. Also complain that IEC is just republishing the same standards with trivial modifications.
 - ◊ US TAG WG (PSRC I4) has found that many vendors are now testing to 61000-4-8, and some have used results to correct design issues.
 - ◊ Annexes explain real-world basis for test levels, but US TAG now thinks the basis should be examined – these test levels may not represent fields during fault conditions. Fields during faults could be worse than test cases.
- 60255-22-1 – 95/204/CDV, *1MHz burst immunity test*
 - ◊ Align existing IEC relay standard with new generic standard 61000-4-18
 - ◊ Most circuits tested at 2.5 kV
 - ◊ Test connections for communications circuits at 1 kV have a new and strange arrangement that triggered much discussion.
 - ◊ Example of difficulty of keeping IEEE standards aligned with IEC – we recently tried to align C37.90.1 with what IEC used to so.
 - ◊ Vote due at end of April 2007

The PSRC is implementing its new strategy for achieving PSRC input to new IEC TC 95 relay standards under development, as explained in September 2006 IEC Report. The branches of this arrangement are:

- PSRC WG for input to TC 95 MT3 developing 60255-1, Common Specifications
 - ◊ Old 60255-6; roughly IEC's C37.90
 - ◊ Mario Ranieri, chairman of WG that just published C37.90.0 revision, is reconstituting this group to feed PSRC and IEEE inputs to IEC maintenance team.
 - ◊ Mario developed comparison document between 60255-6 and new C37.90.

- ◇ IEC draft for 60255-1 should be available for review in February
- PSRC WGs for input to TC 95 MT4 developing 60255-127 under and overvoltage relays and 60255-151 under and overcurrent relays
 - ◇ IEC maintenance team convenor is Dr. Murty Yalla, USNC
 - ◇ PSRC WG to be led by Gabriel Benmouyal to handle PSRC input for both of these.
 - ◇ Incorporate revised IEC 60255-3, not published, derived from IEEE C37.111.
 - ◇ IEC Draft should be available to PSRC in February.
- PSRC WGs for input to TC 95 MT4 developing 60255-121, Functional standard for distance protection
 - ◇ To be reviewed by Alex Apostolov's PSRC WG on standardized distance relay characteristics.
 - ◇ IEC Draft should be available to PSRC in February.

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

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

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

IEC 61850 Revision release plans – new upcoming editions that will address TISSUES and new extensions to the services and models:

Edition 1+	Edition 2	Edition 3
Interoperability TISSUES	TISSUES - new TISSUES are collected until CDV stage) Basic model extensions (*) - Statistical / Historical - Security aspects from IEC 62351 - Common usable elements from Hydro and Wind standards Domain model extensions (*) - Power Quality Models - Monitoring extensions from IEC 62271-003 Impact of SS-SS communication Testing - Client conformance testing - Tool conformance testing	TISSUES Basic model extensions - Description of programmable scheme logic (in SCL) (over communications) - Network and system management - Common usable elements from DER standard - Redundancy Domain model extensions - Low voltage applications (German Report) - Eliminate IED specific settings Impact of SS-CC communication Testing - System testing?
continuously	CDV 2007 / FDIS 2008	

(*) These are the driving factors

Meetings of WG 10 and IEC 61850:

- UCA International Users' Group (IUG) is meeting after PSRC Meeting in Scottsdale on January 11. See <http://sharepoint.ucausersgroup.org/>. Also meeting at DistribuTECH in San Diego.
- The next TC 57 WG 10 meeting begins on Feb. 6 in San Diego, after DistribuTECH.

The Standards Coordinator, Jeffrey Gilbert, met with the Chairs of the Working Groups writing and revising standards documents at a session beginning at 8:00 AM on January 9, 2007, in the Painted Mtn. B room of the Embassy Suites Hotel - Scottsdale, Arizona.

The status of selected PARs, Standards and Guides, were reviewed at the meeting. The status of the PARs is summarized below. The actions to be taken for keeping up-to-date the approval of the PARs and for keeping live the Standards and Guides are identified. A summary of the specific approvals received, since the May 2006 meeting of the PSRC, are identified as well.

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

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

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

Information on	Web site address
Update your information with SA	http://standards.ieee.org/resources/development/
myBallot Voter presentation	http://standards.ieee.org/db/balloting/myballotdemo.ppt
myBallot Chair presentation	http://standards.ieee.org/db/balloting/myballotchairdemo.ppt
PAR application, extension and other forms	http://www.standards.ieee.org/guides/par/
Submitting a PAR	http://standards.ieee.org/guides/par/ePARform.html
PAR Extension	http://standards.ieee.org/guides/par/extension.rtf
Style manual	http://www.standards.ieee.org/guides/style/2000Style.pdf
Template	http://www.standards.ieee.org/resources/spasystem/index.html
Up-load drafts for balloting	http://standards.ieee.org/eprocess/upload_balloting_file/
Request for invitation to ballot	http://standards.ieee.org/resources/development/
Join a balloting pool	Follow: Balloting the Draft → Ballot Invitation → Requesting a Ballot Invitation
Submit request for initiating balloting	http://standards.ieee.org/resources/development/ Follow: Balloting the Draft → Sponsor Ballot → Requesting Initiation of a Ballot
Submit request for recirculation ballot	http://standards.ieee.org/resources/development/ Follow: Balloting the Draft → Sponsor Ballot → Requesting Initiation of a Ballot → Recirculation ballot
Status of standards etc	Http://www.standards.ieee.org/db/status/status.txt
NesCom activities	http://www.standards.ieee.org/board/nes/

RevCom activities	http://www.standards.ieee.org/board/rev/
SA Operations Manual	http://standards.ieee.org/sa/sa-om-toc.htm
SA Bylaws	http://standards.ieee.org/guides/bylaws/index.htm
SB Operations Manual	http://standards.ieee.org/guides/opman/index.html
SB Bylaws	http://standards.ieee.org/guides/bylaws/index.html

Important Information

All Standards developing groups are required to submit an L50-S form annually beginning in 2006. The report for 2006 is due March 2007; however, there is no need for working group chairs to submit the form. The Standards Coordinator will submit one L50-S on the behalf of all PSRC working groups, indicating that the working groups have no financial activity to report. Do not send reports to the PSRC secretary

Standards Coordination Effort

A link to a list of PSRC standards and standard projects has been added to the PSRC standards web page.

PARs applied for by all Committees of the Power Engineering Society (PES) are circulated among the Standards Coordinators of the PES Committees. Every PAR approved by the Standards Board is posted on the SA Web site at the following address.

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

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

P1777 - Using Wireless Data Communications in Power System Operations

Chair : Frances M Cleveland, Email: fcleve@ix.netcom.com

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

Standards Activities Since The May 2006 Meeting

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

1. Standards Published

None

2. Standards waiting to be Published

C37.101	IEEE Guide for Generator Ground Protection
C37.102	Guide for AC Generator Protection
C37.109	Guide for the Protection of Shunt Reactors
C37.116	Guide For Protective Relay Application To Transmission-Line Series

- Capacitor Banks**
- C37.231** **Recommended Practice for Microprocessor-based Protection Equipment Firmware Control**
- C57.13.1** **Guide for Field Testing of Relaying Current Transformers**
3. Standards reaffirmed
- C37.90.3** **IEEE Standard Electrostatic Discharge Tests for Protective Relays**
- C37.96** **IEEE Guide for AC Motor Protection**
- C37.99** **IEEE Guide for the Protection of Shunt Capacitor Banks**
4. Standards submitted for reaffirmation
- C37.112** **IEEE Standard Inverse-Time Characteristic Equations for Overcurrent Relays**
5. Standards approved
- PC37.102** **Guide for AC Generator Protection**
- PC37.109** **Guide for the Protection of Shunt Reactors**
- PC37.116** **Guide For Protective Relay Application To Transmission-Line Series Capacitor Banks**
- PC37.231** **Recommended Practice for Microprocessor-based Protection Equipment Firmware Control**
- PC57.13.1** **Guide for Field Testing of Relaying Current Transformers**
6. Standards submitted for approval
- PC37.102** **Guide for AC Generator Protection**
- PC37.109** **Guide for the Protection of Shunt Reactors**
- PC37.116** **Guide For Protective Relay Application To Transmission-Line Series Capacitor Banks**
- PC37.231** **Recommended Practice for Microprocessor-based Protection Equipment Firmware Control**
- PC37.102** **Guide for AC Generator Protection**
7. Standards to be submitted for approval
- None**
8. Submitted for Balloting/ Recirculation
- PC37.91** **Guide for Protecting Power Transformers**
- PC37.117** **Guide for the Application of Protective Relays Used for Abnormal Frequency Load Shedding and Restoration**
- PC37.231** **Recommended Practice for Microprocessor-based Protection Equipment Firmware Control**
- PC37.232** **Recommended Practice for Naming Time Sequence Data Files**

9. Standards Balloted

PC37.91 Guide for Protecting Power Transformers

10. Standards Re-circulated

**PC37.117 Guide for the Application of Protective Relays
Used for Abnormal Frequency Load Shedding
and Restoration**

**PC37.231 Recommended Practice for Microprocessor-based
Protection Equipment Firmware Control**

PC37.232 Recommended Practice for Naming Time Sequence Data Files

11. Standards to be Re-circulated

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

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

**C37.94 Standard for N times 64 kilobit per second optical fiber interfaces
between teleprotection and multiplexer equipment.**

**C37.95 IEEE Guide for Protective Relaying of Utility-Consumer
Interconnections**

**C37.104 Guide for Automatic Reclosing of LineCircuit Breakers for AC
Distribution and Transmission Lines**

C37.108 Guide for the Protection of Network Transformers

**C37.90.1 Standard Surge Withstand Capability (SWC) Tests for Protective
Relays and Relays Systems**

The PARs approved since September, 2006, submitted, and the PARs for which extension has been applied are as follows. PARs, which will expire in 2007, are also listed. Applications for extending the lives of these PAR's must be submitted before the 15 October 2007 submittal deadline (for the December 2007 standards board meeting).

13. New PARs applied for

None

14. New PARs approved

None

15. PAR Extensions applied for

**PC37.110 Guide for the Applications of Current
Transformers Used for Protective Relaying
Purposes**

**PC37.230 Guide for Protective Relay Applications to
Distribution Lines**

16. PAR Extensions approved

**PC37.110 Guide for the Applications of Current
Transformers Used for Protective Relaying**

Purposes

- PC37.230** **Guide for Protective Relay Applications to Distribution Lines**
17. Modified PAR approved
None
18. Modified PAR Submitted
None
19. PARs Wthdrawn
PC37. 98 **Standard Seismic Testing of Relays**
20. PARs expiring at the end of 2007
PC37.105 **Standard for Qualifying Class 1E Protective Relays and Auxiliaries for Nuclear Power Generating Stations**
PC37.110 **Guide for the Applications of Current Transformers Used for Protective Relaying Purposes**

SUBMITTAL DEADLINES & STANDARDS BOARD MEETING SCHEDULE

PAR/Standard Submittal Deadline	Standards Board Meeting
February 9, 2007	February 21, 2007
April 27, 2007	May 15, 2007
October 15, 2007	November 29, 2007

For further information download the report and spreadsheet from this site
or contact: Jeffrey G. Gilbert - PSRC Standards Coordinator at: jggilbert@ieee.org/font

Substation Committee Report

Dood

C0 Data Acquisition Processing and Control Systems Subcommittee Mike Dood, Chair

The Substations Committee C0 Subcommittee working groups and task forces met jointly with the PSRC at their January meeting in Scottsdale, AZ.

The subcommittee met on Tuesday afternoon. At this meeting the following was included:

- Discussed the status of all current projects.
- Discussion of the new Substation Committee Brochure
- Officer changes within the Substation Committee
- Possible future panel sessions and papers
- Will pursue a new effort that will focus on the settings required on Ethernet switches and routers when implementing IEC-61850. Tim Tibbals will chair this new working group.
- Discussed the possibility of pursuing a Corrigendum on 1613 Standard Environmental and Testing Requirements on Communications Networking Devices in Electric Power Substations to add wording to clarify manufacturer's conformance.

Working Group C1, Application of Computer Aided Systems to Substations met on Tuesday morning. The Vice-Chair, Mr. LaCroix gave an overview of P1686 – Standard for Substation IED Cyber Security. The draft has been completed in IEEE format and circulated to the C1 group for final comments. The ballot pool has been opened and comments are already being received. Comments from the result of this meeting will be incorporated into the final draft. It is expected that final approval of the working group will be solicited via email.

A working session of Task Force, C3TF1, Recommended Practice for Substation Networks met on Monday morning. Since last meeting in Sept (Atlanta), we had 2 recirculation ballots. Final results:

- 122 eligible folks in the ballot pool
- 86% returned
- 98 affirmative
- 1 negative w/ comments
- 0 negative w/o comments
- 6 abstentions
- Total: 105 votes with 99% affirmative
- No response from remaining negative balloter despite multiple attempts
- RevCom submission on 11/22/06
- Scheduled to be reviewed by RevCom in "early January"

This is expected to be the last formal meeting of this working group. The group recognized the chair, Michael Thesing for the outstanding job he did in creating this standard.

A working session on PC37.1, Standard for Automation and SCADA Systems, met on Monday morning. This effort received a PAR extension on December 6, 2006. The current plan is to go to ballot by July 07. The chair of WG C3, Craig Preuss, led a discussion on what needs to be completed prior to submitting a document to be balloted. The schedule is to submit the final document to SA by April 20 and to begin balloting by the end of May. It is recognized that this is an aggressive schedule and a lot of work needs to be done to make these dates.

WG C4 P1689 - Title: Standard for Cyber Security Serial Data Links – Chair: John Tengdin met on Monday afternoon. The comments that were received from latest draft were reviewed.

The first formal meeting of WG C6 was held on Monday afternoon. This working group is defining the cryptographic protocol for cyber security of serial SCADA links and engineering access points that implement the requirements of IEEE P1689. The name of the effort is Trial Use Standard for a Cryptographic Protocol for Cyber Security of Serial SCADA Links. Dave Whitehead is the chair. The initial draft was discussed at this meeting.

On Wednesday a joint meeting (PSRC I14 and Substation C5) on the revision of C37.2 was held. IEEE Standard Electrical Power System Device Function Numbers and Contact Designations. The chair, John Tengdin led discussion centered on the expected scope of this revision. There was lot of good discussion on the proposed use of function code 16 as a 'Data Communications Message Processing Device'. Assignments were made to provide real world examples of how this could be used.

On Wednesday a joint meeting (Substation and PSCC) of P1777 Using Wireless Data Communications in Power System Operations (Marc LaCroix/Francis Cleveland) was held. This will be a joint effort between these two committees. This was their initial meeting. C0 will be forming a working group that will be for the purpose of supporting this effort. The PAR is in the PSCC. The initial part of this effort is to send out a questionnaire to the utility industry. Their first step is to finalize the questionnaire and send it out early next month.

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

PSCC Meeting Report

Cleveland

The Power System Communications Committee met coincidentally with the PSRC here. The minutes of the PSCC are attached to these minutes as Appendix A.

B: ADVISORY COMMITTEE

Chair: Charlie Henville
Vice Chair: Miriam Sanders

B1: Awards and Technical Paper Recognition

Chair: Mike McDonald
Vice Chair: Bob Beresh

The group met on Tuesday January 9th with 4 out of 6 members present.

The two new SC Vice Chairs were asked to consider being the new A&R VC in order to help maintain continuity in understanding the work the WG needs to do. Bob Beresh has agreed to be the new Vice Chair.

Discussion followed in regard to how to recognize WG members. Presently the WG Chairman gets a Certificate of Appreciation. It was suggested that there be a formal letter sent to all WG members thanking them for their contribution. This idea to be brought forward in the ADCOM meeting.

It was decided that at the Main Committee meeting, in order to note the transition of leadership, four past Chairs will be informally recognized for their service with formal awards scheduled to be presented at the May meeting in Nashville. The past Chairs recognized are:

Philip Winston, Past Chair PSRC
Jim Ingleson, Past Chair Relaying Practices Subcommittee
Charlie Sufana, Past Chair Substation Protection Subcommittee
Frank Plumptre, Awards and Recognition Working Group.

B2: Fellows Awards

Chair: J.S. Thorp

The Working Group met in Scottsdale on January 9, 2007.

The PSRC, PES, and IEEE processes for the Election of Fellows were reviewed. The fact that only the IEEE committee sees the reference letters was discussed. Various techniques to improve our success with nominations were debated.

B3: Membership Committee

Chair: M.J. Swanson

Attendance during the PSRC meeting was approximately 200. This is considered normal since we had joint meetings with CIGRE and the Communications Subcommittees, and the location.

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

No management support letters were written.

There were several Salt River Project engineers attending our meeting.

I created 4 more certificates for attendance longevity, and these were awarded. We have about 6 more to go, plus about 37 for revision.

B4: O & P Manual and WG Training

Chair: R. Hedding

A session was held Tuesday morning with 14 working group chairs and/or vice chair present. After a short introduction as to what the training was all about, Rich Hunt gave a presentation on "The Duties of a Working Group Chair". A copy is attached for the minutes. A discussion followed on several issues pertinent to the chairs. This session will be held annually.

B5: Bibliography and Publicity

Chair: T.S. Sidhu

Vice Chair: M. Nagpal

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

B8: Long Range Planning

Chair: Phil Winston

The Long Range Planning TF continued its discussions in support of activities to make changes to the organization and programs of the PES General Meetings. Rick Taylor gave an update on issues and potential options related to paper presentations (or not) at the General Meeting. Additionally, the group noted several cases where the work of the PSRC met issues at the final stages of approval. These cases pointed out that there perhaps needed to be a more proactive approach to seeking 'coordination' or 'liaison' on projects. More discussion on this item will take place with the Standards Coordinator.

B9: PSRC Web Site

Chair: Bill Lowe

The routine duties of preparing the web pages to reflect the January 2007 meeting were updated successfully as new information became available. All other regularly occurring tasks have also been completed.

A new page has been made for "Terms" that are under development or waiting for approval. This new page can be accessed from the top frame of the main PSRC page. The "Fellows" page was updated to add two missing PSRC members who are missing from the list. The B9 site has had some development with the addition guides specific to the PSRC pages.

Jim Ingleson, Russ Patterson and Randy Crellin will be taking care of future web activities. The division of responsibilities will be established gradually. To describe the requirements of the webmaster task, a list of basic web duties was developed. Jim will take care of the May 2007 meeting and other regularly occurring events for the first four months of the year. Russ will be taking care of the September 2007 meeting requirements. Jim, Russ and Randy will share responsibility of other tasks that may arise. Bill has prepared several guides and will prepare others in the future. The transition of the new web masters should be a little easier with the availability of these guides. Bill will be available for questions and advise if and when needed. Bill will be available for any emergency needs that may arise.

Russ Patterson has accepted the responsibility for the Listserv email reflector. A basic guide was developed to make this transition easier.

Bill will not be completely removed from web tasks until the other volunteers feel comfortable with their new duties. Bill will continue to develop and improve some new web pages and content.

C: SYSTEM PROTECTION SUBCOMMITTEE

Chair: T. Seegers
Vice Chair: R. Hunt

The System Protection Subcommittee met on January 11th, 2007 in Phoenix, AZ. 53 people attended the meeting, including 14 members.

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

The Vice-Chair provided updates from the PSRC Advisory Committee. The status of all Standards, and all PARs, is now available on the Standards page of the PSRC Website.

WG C1 Cyber Security Issues for Relaying as completed its assignment, and the Subcommittee voted to dissolve the Working Group.

The Subcommittee voted to establish a new Task Force, CTF14, on the "Impact of the Application and Deployment of PMUs on Protective Relaying". The Task Force will be chaired by Jim O'Brien, with Alla Derojna as the Vice Chair. The Task Force will report on practical applications of PMUs as pertains to protective relays, as well as the impact of configuring, installing, maintaining, and operating PMUs will have on protective relay personnel at utilities.

Lively discussion also occurred on a possible WG topic concerning on issues surrounding the development of line protection settings impacted by the addition of IPPs. No Task Force or Working Group will be started at this time. Mukesh Nagpal and Alla Derojna will submit a possible scope to the Chair and Vice Chair. The Chair and Vice Chair will coordinate with D and K Subcommittees to see if this is a possible topic for a Working Group.

WG Reports:

C1: Cyber Security Issues for Relaying

Chair: Solveig Ward
Vice Chair: Jim O'Brien
Output: Paper
Established: 2004
Expected Completion Date: 2007

The C1 working group met with 11 members and 18 guests in attendance.

The comments from the ballot of the paper were reviewed with the following resolutions:

- 6.1.2.5, page 12 In the second & third sentence, several words are capitalized.

-Change accepted

-8.6, page 16 The paragraph under 8.6 is not related to power quality.

-“Power quality” removed.

-9.2, page 18 Wrong table reference given for Miscellaneous and unusual methods.

-Reference corrected

-10.4.1, page 26 Paragraph merely lists a publication.

-This comment apparently from a previous draft and not applicable to the latest one.

- Page 28,30 Reference is made to appendices C & D

-The appendices referenced are in a referenced source and don't need to be duplicated in this paper

- Paper Structure in General The Report has a lot of good information, but was difficult to follow and I found the material confusing. Not really sure what the security issues are, and how I would prevent possible embarrassment, equipment failure, and financial loss.

-Reword the sentence about “possible embarrassment..”

- Section 4.1 Relay Setting Considerations Disagree with title
-Renamed section to “Relay Access and Settings Considerations”

- Section 4.1 Relay Setting Considerations Page 7, paragraph 4. Non-utility employees should not be permitted remote access – these individuals may be allowed local access for limited periods during installation and commissioning work. Relay passwords should be modified to meet utility standards by utility relay engineers after contract individuals have completed their work – simple, non-secure passwords are used by contractors during work.

-No change necessary

- Section 7 Relay Pilot Channels What is the risk and how would someone hack into a Relay Pilot Channel? Since these are typically dedicated single point-to-point networks I would think this is a low security risk.

-Has been discussed before, no changes necessary

- Section 15 Future Directions The first paragraph mentions security policy. A good security policy is not a future consideration but a current reality

-Renamed section to “Conclusion”

The final paper with all the changes will be sent to the working group for review and will be submitted to the PSRC by the May meeting.

The complete paper is 28 pages long but a PES version that is limited to 8 pages had been requested. That shortened version had been created and sent out for comments prior to this meeting. Those comments were reviewed and appropriate changes made. The PES version has to be in its final form and submitted by January 15. Solveig made the changes and resent to the working group for comments so the deadline can be met.

Joe Weiss noted that FERC has rejected the NERC proposed Cyber Security Standard. A 100 page document by FERC about their rejection is available at the FERC.gov website. Joe recommends everyone read the document.

As the work of this working group is complete, no future meeting will be required.

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

Chair: **Steve Kunsman**

Vice Chair: Gary Kobet

Output: Report

Established: 2003

Expected Completion Date: 2007

Working Group C3 met Tuesday, January 9, 2007 in Scottsdale, AZ in a single session with 12 members and 21 guests participating.

Voting of working group and subcommittee is complete with only 1 disapproved vote that has been resolved through comment acceptance. The report is now at Final Draft 7.1 and the working group discussed the last remaining comment on section 8.2 has been accepted and will be revised. Editorial comments will be accepted up to 30-January when the final version 7.2 will be distributed to the main committee for vote.

The working group results will be presented at Texas A&M Relay Conference as a panel session and Georgia Tech as a conference paper. The remaining activities will be to prepare a summary presentation for these conferences.

Eric Udren has accepted to represent the C3 report at Texas A&M panel session

Kevin Donahoe has accepted to present the C3 report at Georgia Tech and Solvieg Ward is backup presenter

The working group met with CIGRE B5-31 working group "Life time management of relay settings" which is closely related to the activities of C3. Peter Crossley presented the B5-31 scope and an open discussion was held. CIGRE is seeking active or Corresponding Working Group members for this activity.

Actions:

1. Kunsman to revise section 8.2/8.3 by 30-Jan
 2. Donahoe to confirm Georgia Tech presentation by 30-Jan
- The WG requests that the final version 7.2 will be posted to the PSRC website on Feb 1

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

Chair: **Vahid Madani**

Vice Chair: Miroslav Begovic

Output: Survey

Established: 2004

Expected Completion Date: September 2007

WG C-11 met on January 9 in single session with total 17 in attendance (11 M, 6 G).

Brief overview of the coordination with CIGRE, the presentation announcements, and additional communications planned through NERC, the IEEE PSCE, and other conferences were discussed.

The WG members reviewed:

- The final version of the HTML
- Reviewed Contact List - "Assistance in completing the survey"
- Reviewed Procedures and who to send filled-out surveys

Survey Broadcast and Dates:

- Release December 2006
- Three follow-ups are planned
- Due date March 19, 2007

The WG members discussed best ways to get respondents to fill out the survey, and best ways to f/u. Several WG members have volunteered to send to their contact colleagues in various parts of the world.

Use of Access Database is suggested given the magnitude of the responses anticipated. Mark Adamiak has volunteered to help with the development of the database by using GE technical team and the spreadsheet developed previously by Stan. Mark described the Access Database preparation will involve:

- 1) Development of Object Model of the survey responses
- 2) Test the model to make sure it maps directly into database (one-to-one mapping)
- 3) Analysis of data using Access Database

Mark is looking at a preliminary version by end of march.

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

C5: Deployment and use of Disturbance Recorders

Chair: **Bill Strang**

Vice Chair: Jeff Pond

Output: Report

Established: 2001

Expected Completion Date: January, 2007

The Working Group did not meet in January. The WG report has been presented to the Main Committee, and the Working Group should be dissolved at the May Meeting. The WG report will be presented at the Georgia Tech Fault & Disturbance Analysis Conference in May, 2007.

C6: Relay Engineering in Power Engineering Curricula

Chair: **Mani Venkata**
Vice Chair: Jaime DeLaRee
Output: Transactions Paper
Established: 2003
Expected Completion Date: 2006

The Working Group did not meet in Phoenix. The Working Group report and Transactions paper has been approved by the members of the C Subcommittee, and was presented at the Main Committee meeting on January 11th. The Working Group anticipates meeting at the May 2007 meeting in Nashville to resolve some final editorial issues.

C9: Under Frequency Load Shedding and Restoration

Chair: **Alex Apostolov**
Vice Chair: Ken Behrendt
Output: IEEE Guide
Established: 1999
Expected Completion Date: 2007

The working group met on Tuesday, January 9th, with 8 members and 2 guests present. Alex announced that the revised guide was recirculated and there were no negative ballots. The revised guide has therefore been sent to IEEE RevCom for final approval.

The next working group task will be to prepare an IEEE Transaction Paper and a Summary Paper. Alex will prepare an outline for the transaction paper and send it to the working group members to solicit volunteers to write sections of the transaction paper. The working group also discussed writing an article for Protection, Automation, and Control World magazine to publicize the new guide.

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

C11: Guide for Protection System Testing

Chair: **Vahid Madani**
Vice Chair: Hyder DoCarmo
Output: Paper
Established: 2005
Expected Completion Date: September 2008

WG C-11 met on January 9 in single session with total 44 in attendance (22 M, 20 G, 2 new members).

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

- Certification tests
- New section on Archiving Test Results (Creating Trail)
- Sections on line differential protection testing and breaker failure scheme testing were discussed.
- Direct transfer trip testing
- Impact of high impedance faults and how a system that utilizes such application can be tested.

For this section, the WG members and guests decided that the theoretical backgrounds may be place in Annex as reference and focus on the testing of the scheme.

Three people have agreed to start to review the entire Draft before the next meeting.

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

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

Chair: Damir Novosel

Vice Chair: George Bartok

Output: Working Group Report and IEEE Summary Paper

Established: 2004

Expected Completion Date: 2007

The working group met with 15 members and 16 guests present, chaired by Damir Novosel.

We reviewed and updated the membership list.

A number of contributions were received since the last meeting. They were incorporated in the revision 6a of the report. It is approximately 85% complete and comprises 95 pages.

Our major task is to complete a few missing sections in Section 5 on Solutions to protection related issues with wide-area stressed conditions. Applicable material already contained in Section 3 on Protection-Related Behavior will be used as the basis for Solutions.

It was also decided to add sections stressing Impact of Voltage Stability on Distance Protection. Gabriel Benmouyal and Shinachi Imai will contribute.

We also need to switch the order of Sections 4 and 5, placing the Field Experience and Examples section at the end of the report.

Additional writing assignments were made for all required report sections and are attached at the end of this report. The writing assignments are due for submission to the working group chair and vice chair by March 20th. Draft 7 will then be created and e-mailed to the members before April 1st. The complete document will be reviewed for consistency and content by Peter Crossley and Demetrious Tziouvaras. They will make updates and create comments for discussions and distribute Draft 7b to the WG members by April 30th.

Working group members should read the document before the meeting to be prepared to discuss the entire report at the May meeting in Nashville.

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

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

C13: Undervoltage Load Shed

Chair: Art Buanno

Vice Chair: Imai Sinichi

Output: Report

Established: 2005

Expected Completion Date: 2008

The UVLS Working Group met for the fourth time with 27 in attendance. This included 12 members and 15 guests.

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

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

Organization of the report was discussed

- Advantages and disadvantages will be included for each reactive power source in Section 2.2
- References should be inserted just after each section.

Comments on the latest draft

- Shunts switched in less than one second would be defined as fast switched shunts rather than discontinuous dynamic sources.
- The paper on CAPS will be referenced.
- Since setting guidance depends on the system characteristics, planning & operating criteria and schemes, section 9.2 will be removed.
- Performance criteria like related system studies, setting consideration/criteria and issues not covered in other sections will be done in section 7.7.3 by Young and Birt.

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

- 2.3 Coordination between UVLS and UFLS will be done by Madani.
- Short summary of UVLS policy by NERC will be done by Tom Wiedman.
- 5.3.2 on UVLS implementation on local distributed (feeder) basis will be done by Burger
- 6.1.1 on voltage slide scheme will be done by Harley.

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

Timeline

April 15, 2007 - Complete writing assignment

May 14-18, 2007 – Next working group meeting in Nashville, TN

August 15, 2007 – First round of editing

September 17-20 – Working group meeting in Charlotte, NC

November 15, 2007 – 2nd round of editing

December 15, 2007 – Submit for ballot

A presentation was made by John Burger on “AEP’s UVLS Scheme” to the working group.

Afterwards the meeting was adjourned.

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

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

No activities to report

NERC by Phil Winston

No substantial activities to report.

Liaison Report of the IEEE PES Power System Stability Controls SC to the PSRC by Charlie Henville

The Power System Stability Controls SC is preparing a report on Blackouts. The current draft of this report was distributed to C Subcommittee members early in January. Anyone with questions about, or comments on, the draft should contact Charlie Henville.

D: LINE PROTECTION SUBCOMMITTEE
Chair: R.A. Hedding

Vice Chair: M.J. McDonald

The Meeting was called to order by Chairman Roger Hedding at 4:30 p.m. on Wednesday January 10, 2007 in the Painted Mountain A meeting room. There were 20 members and 36 guests present

After introductions, the Minutes of the September 2006 meeting in Atlanta were Approved.

Advisory Committee items of interest:

Everyone was reminded to insure proper coordination of their WG activities with other interested PES Technical committees.

It was requested that subcommittee attendees review the "IEEE Power System Dynamic Performance Task Force on Blackout Prevention" paper which had Chapter 2 co-authored by Charlie Henville. It is suggested that any comments be forwarded to Charlie and that this paper is a good educational tool in regard to the issues involved.

Liaison reports: none

New Business:

Rick Taylor requested a Task Force be formed to look into the sensitivity/coordination of ground directional overcurrent relays with ground distance relays. After discussion, it was agreed to form Task Force D24 with Rick as the Chair and will first meet at the May meeting in Nashville.

Chairman Hedding again asked for support in filling out a CIGRE TF B5-94 High Impedance fault survey. Attendees were asked to fill out the survey and file it directly with Mr. Inaki Ojanguren at the email address on the survey.

The result of the Task Force D22 Chaired by Roger Hedding on forming a response to the NERC SPCTF letter on transmission line relaying performance will be the formation of WG D22 which will be chaired by Tom Wiedman. The WG will first meet at the May meeting in Nashville.

Chairman Hedding announced that the Reclosing Guide will be up for re-affirmation this year and to watch for information on that effort which will be forthcoming.

Miriam Sanders announced that the Communications SC will be meeting with us in Nashville and the Power Line Carrier group will be meeting on Monday working on C93.4 with attendance from interested PSRC members requested. Discussion topics to include hybrids and filters. This is an excellent way to learn more about Power Line Carrier equipment.

High Impedance Fault activity:

The meeting was adjourned at 5:20 pm.

Working Group reports:

D1: Cold Load Pickup Issues and Protection

Chair: Dean Miller

Vice Chair: Tony Sleva

Established:

Expected Completion: December 2007

Output: Special Report to the PSRC

The WG met on Wednesday morning, January 10, with 12 members and 3 guests present. We reviewed draft 3 of the report with emphasis on the five completed writing assignments that were received since the September meeting. Three new writing assignments were made. Those writing assignments are due on March 1. At which time this material will be incorporated into draft 3 and the new draft will be sent out to the working group members for review and balloting. At the May meeting we will discuss the issues that come

out of that ballot, with the goal to have the report ready for the Line Subcommittee by the September meeting.

D4: Application of Overreaching Distance Relays

Chair: Russ Patterson

Vice Chair: Walter McCannon

Established:

Expected Completion: September 2007

Output: Report to the PSRC

Working Group D4 met with 13 members and 26 guests. Total in attendance was 39. The UCTE blackout of November 4, 2006 was briefly discussed. A guest from Stattnet mentioned that conditions at the time of the initiating event allowed for a large amount of wind generation to be online. This likely contributed to the subsequent events.

The latest draft of the document was reviewed and edits made based on the consensus of the working group members present. Several sections were determined to be off topic and were removed.

The following assignments were accepted and are due the first week of March.

- Ratan Das - review section 2.A & offer revision.
- Russ Patterson - rewrite section 3.A.2 & 4.C.6.
- John Burger - rework the paragraph on outfeed.
- Ken Behrendt - reword section 4.C.2.
- Tom Wiedman - write section 3.C.2
- Mike McDonald - write section 3.C.4 referencing D6 paper.
- Don Lukach - write section 6.C.
- Mark Schroeder - write section 6.D.

D5: Guide for Protective Relay Applications to Distribution Lines

Chair: Phil Waudby

Vice Chair: Randy Crellin

Established: January 2002

Expected Completion: PAR extended to 2008

Output: IEEE Guide PC37.230

The working group met in a double session with 20 attendees (15 members and 5 guests).

After introductions, reading of the PAR, and acknowledgement of the IEEE-SA Standards Board Bylaws regarding patents, we discussed the current status of the working group and identified the upcoming plans to complete the document.

During this double session, we finally completed the review and discussions of the review comments that we received from the initial balloting of Draft 4.0 of the document.

Phil Waudby, Randy Crellin, and Mark Schroeder agreed to review the document again to check for the proper use of the words "Must", "Shall", and "Will". After final revisions, the document will be posted on the PSRC D5 website for two weeks to allow the working group members to read and provide final comments prior to recirculation. Notification will be emailed to working group members when the document has been posted.

We are planning to re-circulate the document (draft 5.3) and discuss any new comments during the May meeting.

We are looking for volunteers to prepare a summary of the guide and to think about individuals that can make presentations at regional technical conferences (Texas A&M, Georgia Tech, WPRC, and MIPSYCON).

D8: Justifying Pilot Protection on Transmission Lines

Chair: Gary Kobet
Vice Chair: Bogdan Kasztenny
Established:
Expected Completion:
Output: Report to the PSRC

The WG met on January 9, 2007 with 20 in attendance: 9 members and 11 guests. The minutes of the September 2006 meeting were approved as printed.

The working group made progress on addressing a number of items identified prior to this meeting. In particular:

- Vahid Madani's suggestion to change the Assignment by spelling out more clearly one clause in the original assignment has been rejected. The WG decided this was not needed and would force us to get back to the Subcommittee.
- Alla Deronja will come up with recommendations for the sequence of organizing the criteria for selecting pilot protection, in Section 3.
- Ilia Voloh will resolve his comments re section 3.2 with Bill Kennedy; and come back with a revised version.
- Bogdan Kasztenny expand section 3.5 on short lines as per Alla Deronja's comments.
- Alla Deronja will review the new material contained in section 3.6.
- Bogdan Kasztenny will rephrase section 3.9 to address Vahid Madani's comment on single pole tripping from time-delayed functions.
- Bogdan Kasztenny will work with Vahid Madani and Al Darlington to have Figure 5 fixed to reflect the discussion in the body of the document.
- The WG decided to remove section 3.11 related to impact of pilot protection on the design of station grounding system; as well as 3.12 on economic considerations.
- Frank Plumtre will review section 3.13 to address comments from Ilia Voloh and rephrase it towards discussion on local/remote backup and side benefits of pilot channels.
- The WG decided to remove "remote-end-just-opened" bullet in section 4.2 (already covered as "loss of load"); as well as the "share comm. path" bullet.
- Ilia Voloh's comment on expanding on SONET will not be followed (already covered). Instead Bogdan Kasztenny made a suggestion to include spread-spectrum radio as a possible pilot channel. Mark Simon will work on this referring to the existing PSRC report on the matter.
- The WG chairs will follow up on missing deliverables (John Miller re section 3; Mark Allen re section 3.3; Elmo Price, Marc Benou and Hyder DoCarmo re SEMI; Mike McDonald re section 3.5; Gary Kobet on section 5.9 – C11 reference).
- Al Darlington will touch up the Figures based on Frank Plumtre's comments.

The WG recommended moving toward wrapping the work up. Mukesh Nagpal and Alla Deronja volunteered to start the editorial work.

Writing assignments are due mid March.

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

Chair: Mohindar Sachdev
Vice-Chair: Simon Chano
Established: 2005
Expected Completion: 2009
Output: Revision of IEEE C37.113-1999 (R2004)

The WG met in one session with 23 members and 12 guests attending the meeting. Simon Chano chaired the meeting on behalf of the chair who could not attend. During the meeting, there were discussions. Related to outstanding assignments to new sections in annexes A and B of the guide. These annexes are attributed to settings and application examples. Simon Chano informed the members that all the proposed examples should meet NERC loadability guidelines. The working group is also considering many issues which are being treated by working group D4 and should be referenced in our guide. The rest of the meeting was opened to review the comments which were received from some members for draft1. Some other modifications were also suggested and new sections were given as assignments to some members for discussion at the next meeting in May.

D11: Effect of Distribution Automation on Relaying.

Chair: Fred Friend

Vice Chair: Gerald Johnson

Established: January 2005

Expected Completion: January 20xx

Output: Report to the PSRC

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

The working group met with 7 members and 13 guests present, chaired by Fred Friend.

A presentation on Distribution Automation using the IntelliTeam system was made by Mike Meisinger. A brief overview of the PulseCloser was also given, along with the challenges facing the protection engineer when using these devices.

A presentation by Ljubomir Kojovic is planned for the May meeting in Nashville.

DTF21: Investigate Supporting IEC STD for Distance Relay Characteristics

Chair: Alex Apostolov

Vice Chair: Alla Deronja

Output: Recommendation in regard to WG formation

Established: September 2006

Completed: January 2007

Task force DTF21 met on January 10, 2007, in Phoenix, AZ, in a single session chaired by Alex Apostolov with 8 members and 9 guests present to define the need and scope of the future working group.

Murty Yalla made a presentation concerning the work being done by IEC TC95 - standards IEC60255-121 (distance relays) and IEC60255-151 (overcurrent relays) - on standardizing impedance relay characteristics, relay performance, accuracy, and testing aspects. Murty pointed out that, in the IEC standards, there will be cross-references to the IEEE C37.2 device function numbers.

This task force was formed to provide an input on the subject to the IEC. There was an extensive discussion regarding the need and scope of the future working group. The focus is to standardize present impedance relay characteristics and to allow room for future developments and extendibility for additional functions/settings. Relay vendors are strongly encouraged to participate and provide their input.

It was referred to the PSRC subcommittee D to approve a formation of the working group to address the proposed scope.

17 persons attended the meeting. 8 of them joined as members of the future working group.

DTF22 NERC SPCTF Letter Response

Chair: Roger Hedding

Established May 2006

Completed: January 2007

Output: Determination of how NERC SPCTF request can be address.

This task force met Tuesday. After extended discussion, the task force concluded that there be a WG formed pending subcommittee approval. This working group would gather information on frequency limits and rate of change of frequency excursions for recoverable disturbances in a first step toward establishing parameters relay functions should meet.

With this in mind, the assignment proposed for the working group is:

Investigate the feasibility of defining a range of frequency and rate of change of frequency to be used in a performance specification for protective relay functions. Draft response to the NERC SPCTF letter requesting this activity.

Tom Wiedman agreed to Chair the WG, thus concluding the task force effort.

D22: Transmission Line Relay Frequency Performance Specification

Chair: Tom Wiedman

Vice Chair: TBD

Established: SC approved at January 2007 for May meeting

Expected Completion: TBD

Output: See proposed assignment below

Proposed Assignment: Investigate the feasibility of defining a range of frequency and rate of change of frequency to be used in a performance specification for protective relay functions. Draft response to the NERC SPCTF letter requesting this activity.

DTF24: *Proposed name:* Transmission Line Applications of Directional Ground Overcurrent Relays

Chair: Rick Taylor

Vice Chair: TBD

Established: SC approved TF at January 2007 for May meeting

Expected Completion: TBD

Output: See proposed assignment below

Proposed Assignment: Investigate the need for a WG to prepare a report on the justifications and application criteria for directional ground overcurrent relays applied for protection of transmission lines.

H: RELAY COMMUNICATIONS SUBCOMMITTEE

Chair: A. Apostolov

Vice Chair: V. Skendzic

The Subcommittee met on 01/10/07 with 13 members and 19 guests. Minutes from the previous meeting were approved.

Reports from the WG Chairs

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

Chair: M. Benou

Vice Chair: M. Allen

Output: Guide

Meeting #3

The H1 working group met with 10 members and 2 guests in attendance, chaired by Marc Benou.

Marc reviewed the assignment of the working group, which is to prepare a document to guide the power system user in applying, installing and operating digital communication channels for the purpose of protective relaying. Activities from the September meeting in Atlanta were reviewed and the IEEE patent policy was covered.

Outline 1.1 was handed out and the order of the sections were reorganized by the working group. A section on satellite communication was added to the Digital Communication Methods section and redundancy and diversity were added to the Planning section. It was decided to table the section on schemes since it is discussed in so many existing IEEE documents. It may be added back if it is determined later that the guide has any unique contributions to make about protection schemes.

Outline and initial writing assignments were given to members.

It was discussed that several subjects are covered in other IEEE documents including but not limited to a previous report (H9 Digital Communications for Relay Protection). It was suggested to use what material we can from the existing documents.

Writing assignments are due to the chair by April 1.

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

H2: Broadband Communications Over Power Line Carrier
Chair: M. Simon
Vice Chair: TBD
Output: Report

The Working Group did not meet this session.

H3: Time Tagging in Protection and Disturbance Recording IEDs
Chair: Bill Dickerson
Vice Chair: J. Ingleson
Output: IEEE Recommended Practice

Meeting #2

The working group met for the first time with 8 members and 12 guests, chaired by Bill Dickerson.

Bill solicited a volunteer to act as Vice Chair without any luck. Miriam Sanders suggested that the Chair could request the Subcommittee, at its meeting, to nominate a Vice Chair.

Bill reviewed the proposed Scope and Purpose, which were developed at the previous meeting. Background information about the need for the work was also presented. The preliminary outline, also developed at the previous meeting, was presented and several volunteers were identified to begin work on parts of the document. Volunteers will be requested to provide their contribution to the Chair by April so that the work can be collated together and distributed to the WG members. The members should come prepared to discuss the contributions at the next meeting in Nashville.

Discussion ensued as to whether the appropriate product of the WG would be a Standard (as approved by the Subcommittee in September), or perhaps a Guide or Recommended Practice. Attendees with significant experience in this area made a convincing argument that the appropriate course of action, given the subject matter of this WG, would be a Recommended Practice with a view towards becoming a full Standard at the next revision cycle. The WG members concurred with this recommendation. As the PAR has not yet been applied for (due in part to the illness of the Chair during the period between the last meeting and this one), the PAR application can be submitted for a Recommended Practice instead of a Standard, prior to the next meeting.

Accordingly, the Working Group requests: (1) for the Subcommittee to assign a vice-chair for the WG; and (2) approval for change of scope to a Recommended Practice rather than a Standard.

Copies of these Minutes, the Scope and Purpose and Outline documents (and the initial draft of the R. P., when available) will be provided to Subcommittee for posting on the web site.

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

H4: Revision of C37.111- IEEE COMTRADE Standard
Chair: R. Das
Vice Chair: A. Makki
Output: Standard C37.111

The Working Group H4, met on January 9, 2007. Twelve members and ten guests were present. Minutes of the September 2007 meeting were approved.

Discussions were held on one assignment by Pierre Martin based on comments received from Mark Adamiak. Pierre will revise the assignment, based on the discussions, within one month. Further comments on the assignment must be provided to the chair by January 16, 2007.

Mark Adamiak presented briefly about a CFG file in xml format. His assignment was distributed to the members before the meeting. All comments on this assignment are due to the chair by February 9, 2007. Draft 1 of the standard will be distributed before the next meeting.

Need a room for 30 people with a computer projector.

H5-a: Common Format for IED Configuration Data

Chair: J. Holbach

Vice Chair: Dac-Phuoc Bui

Output: Report

Need a room for 30 people with a computer projector.

H5-b: Common Data Format for IED Event Data

Chair: M. Adamiak

Vice Chair: P. Martin

Output: Report

Need a room for 30 people with a computer projector.

H5-c: Common Data Format for IED Sampled Data

Chair: B. Vandiver

Vice Chair: B. McFetridge

Output: Report

Status: Draft #5

The working group met on Wednesday, January 10, 2007, with 6 members and 8 guests present following sessions with H5-a and H5-b. The meeting minutes from the Sept meeting in Atlanta were reviewed and approved by the group.

Draft #5 of the report was reviewed with focus on section 4.4 describing the conversion requirements between IEC 61850 sampled data to/from COMTRADE. Many details were discussed with additional recommendations for 61850 data extensions being agreed to. These changes will be put forth by Christoph to TC57 for consideration.

Alex noted that a Definitions table of terminology for the newly recommended data types would be necessary as part of the Definitions section. One will be started and circulated for members and guests to contribute their ideas. Once compiled, the report will be circulated for consideration as a final draft.

All updates will now be posted to the website, H subcommittee section for download. Further edits and contributions on the report are due by March 16th for inclusion in the final draft that will be distributed and reviewed prior to the May meeting. Hopefully this will complete the report so it can be confirmed by the working group as final at the May meeting.

The H5-c working group expects to meet again following sessions of H5-a and H5-b in a combined meeting requiring a room for 30 with PC projector and screen as part of the ongoing triple session.

H6: Ethernet LANs in Substation Protection and Control

Chair: J. Burger

Vice Chair: C. Sufana

Output: Paper

Status: Perpetual

H6 Working Group met with 11 members and 17 guests with Chairman John Burger presiding.

After introductions, John gave a short update on the working group's status. The paper is finished but the working group will remain as a forum for IEC 61850 activities.

The minutes for the September 2006 meeting were approved.

Tim Tibbals of SEL said IEC editors met for 7.2 for final review before going to FDS. There were over 400 TISSUES originally. Stan Klein gave some other updates about device names.

Joe Hughes EPRI gave a short update. He mentioned that there is work ongoing for funding for 37G, continuing harmonization work, network and system management, security issues, interoperability testing.

Alex Apostolov said that there is much to discuss about models.

John Burger reported on the latest AEP efforts to use IEC61850; they trying to get a copperless panel going. No copper will be going into any carrier set and they will be using a fiber LAN. AEP is going to measure the carrier set levels and will send a GOOSE message of the values; the messages will originate from a checkback device or will be timed. There was some discussion on whether a GOOSE was needed or do a GET DATA. AEP plans on getting 4 or 5 alarms, starts/stops, and carrier levels out of the carrier sets.

John Tengdin indicated that C37.2 will be meeting Wednesday to work on cross referencing IEC61850 logical nodes. At issue will be how to represent switches, a routers, etc. The plan is to use unused device number 16 with a suffix to ID what the device is.

Charlie Sufana mentioned that at the C3-TF1 meeting there was a need for an application guide for switch/router settings.

Veselin Skendzic gave a presentation on an IEC61850 application at the La Venta II substation. There were 24 devices, 6 vendors, and 9 different product platforms installed for a windfarm for CFE. IEC 61850 GOOSE messages were developed for interlocks. Bay control and protection units were incorporated into the devices. Legacy protocols Conitel 2020 and DMP were also used. CFE felt that they would use the setup to compare conventional wiring to GOOSE. They tested SNTP and IRIG; eventually they elected IRIG for timing. It was noted that 1 microsecond timing is required. It was mentions that IEEE Std 1588 (currently being revised) is able to address this need. CFE also requested controls filtered by source; it was discovered that not all vendors could support orCat. They also had trouble with naming due to word length and it was very time consuming to get DNP and Conitel to go to IEC61850. CFE realized that they may need to change their own rules to accommodate the newer equipment capabilities. As a test, CFE's GOOSE project goals were to use breaker failure for test. They determined that GOOSE retrips came in about 12.5ms faster than hardwired. CFE's confidence in using the equipment was enhanced by the use of SER and event reports during configuration and troubleshooting. CFE is now looking to use GOOSE for beyond just interlocks. One of the main results of this effort was that perhaps the largest burden is the interface from the substation to the control center using legacy protocols.

For the next meeting, single session with a computer projector and room for 50 is requested.

H7 **Comparison of IEEE/IEC Standards**

Chair: M. Simon

Vice Chair: E. Fortin

Output: Report

Meeting # 3

H7 met on Tuesday Jan 9th with 9 members and guests. The first draft of the compilation was reviewed. Several standards were added to the draft. IEC standards tend to reference other IEC standards, suggesting that the list will continue to grow as the work continues.

The Compilation will be parsed into categories prior to the next meeting. Prior to competition of the working group report the compilation document, which is useful as an index of relevant, documents and will be posted to the PSRC web site.

The group will continue the compilation and begin acquisition of documents that require review beyond the IEC/IEEE abstract data.

Single Session, 20 people, and no A/V equipment needed.

H8: **File Naming Convention**

Chair: A. Makki

Vice Chair: E. Gunther

Output: Standard PC37.232

The group met on time with 3 members and 1 guest present.

The chair was pleased to report that all negative ballots had been resolved and that the work now stands at 100% approval rate.

The vice chair reported that the final draft will be circulated for a period of 10 days and will then be submitted for Revcom approval before the end of January.

At the conclusion of business the meeting was adjourned. The group will meet again during the upcoming spring meeting.

A room for up to 20 people with a flip chart was requested.

H9: Understanding Communications Technology for Protection

Chair: Mohindar Sachev

Vice Chair: Marc Benou

Output: Paper

Meeting # 3

The H9 working group met with 11 members and 5 guests in attendance, chaired by Marc Benou in the absence of Mohindar Sachev. Solveig Ward acted as Vice Chair for the meeting

Marc reviewed the assignment of the working group which is to prepare a document that would assist engineers in understanding the communications technology for protective relaying. We went through the outline and assignments were given to members of the sections not previously assigned.

A previous report (H9 Digital Communications for Relay Protection) is covering much of the material that is planned for the present report, and it was decided to re-use this information and reference it. It was also determined that IEEE C37.93 and IEEE 487 would be good references for several of the writing assignments

Writing assignments are due to the chair and vice chair by March 15.

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

H11: C37.118 clarification and interpretation WG

Chair: K. Martin

Vice Chair: D. Hamai

Output: Paper

Working Group H11 met at 8:00 am on Wednesday, Jan 10 in a double session with 8 members and 16 guests. The minutes from the September 2006 meeting were read and approved.

The current WG status is completing the transactions paper and starting work in resolutions of implementations issues. It is also supporting the Dual Logo effort of extending the standard to be additionally approved as an IEC standard.

In September 2006 the Relay Communications Subcommittee approved the H11 proposal of fielding implementation questions and issues regarding the standard. That effort was kicked off with the following plan:

- Set up information on the PSRC web site under WG H11
 - Post notice of availability to field questions and comments
 - Post an email address that can be used for inquiry (address to all members)
 - Post notice that answers & recommendations are not normative or part of the standard
- Use email for WG decisions and respond directly for short answers
- Refer more complex issues to WG at PSRC meetings
- Set aside issues that require normative changes for next C37.118 revision
- Change WG name to C37.118 clarification and interpretation WG

Discussion of current issues before the WG was started, but no conclusive answers were produced.

The transactions paper presenting the Synchrophasor Standard was reviewed. It is in the final IEEE format and nearly complete. Several points were brought up and discussed. Some wording changes were made and a few more will be forthcoming. These last changes will be made, the paper will be balloted in the WG, and when approved, it will be submitted to IEEE for publication.

The working group will meet in May 2007 in a single session, need room for 30 people, and need a computer projector.

H14: Telecommunications Terms Used by Protection Engineers

Chair: R. E. Ray

Vice Chair: R. Young

Output: Paper

H14 met on Tuesday, January 9, 2007. Introductions were made.

There were five members and three guests present.

Two out of four assignments were reviewed and the definitions were added to the document. The other two assignments will be sent out to the members for comments. Also a group of words that was suggested by a member that no one else was familiar with will be assigned to the individual who suggested them. If all this work is carried out by the next meeting in May, then only one more meeting is needed to complete the document.

We will not be accepting any more terms to be included in the document. We will finish up our report and publish the document on the PSRC web site. After it has been out for a while we can then revisit and revise the document.

Need a room for 10 people plus a computer projector for the May meeting.

HTF1: Device Naming Convention

Chair: A. Makki

Vice Chair: J. Hackett

Output: Report

The group met on time with 10 members and 5 guests present. The group discussed the need for having a standard device naming convention. A presentation on IEC61850 device names was presented and then a statement of up to 5 minutes was delivered by each of the members and guests present. The group agreed that standard device names will have a positive impact on maintenance, operations, engineering, coordination and automation.

At the conclusion of business the meeting was adjourned. The group will meet again for the final time during the upcoming spring meeting to develop an assignment statement in order to form a new working group. A double session with a room for up to 20 people was requested.

Liaison Reports

PSCC Liaison Report

E. A. Udren

The PSCC met at the PES General Meeting in June in Montreal. The PSCC is meeting with the PSRC in Scottsdale, and at the Summer PES Meeting in Tampa, June 27-28.

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

The Wire-Line Subcommittee has published IEEE 820 - IEEE Standard Telephone Loop Performance Characteristics. IEEE 487-2000 IEEE Recommended Practice for the Protection of Wire-Line Communication Facilities Serving Electric Supply Locations, was completed and has been balloted. This SC has a new WG that has obtained a PAR for P1692, A Guide for the Protection of Communication Installations from Lightning Effects. Work continues on P1590, IEEE Recommended Practice for the Electrical Protection of Communication Facilities Serving Electric Supply Locations Using Optical Fiber Systems.

IEC TC 57 Working Group 10 Liaison Report

E. A. Udren

WG 10 is responsible for IEC 61850, Communication Networks and Systems in Substations. WG 10 met in Arnhem in October, and next meets in San Diego right after DistribuTECH in early February.

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

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

WG 10 has published a plan for development of upcoming editions or revisions of 61850. These will include clarifications and additions to resolve important TISSUES, as well as new extensions of services and object definitions. See IEC Report for the plan.

Related to WG 10 and IEC 61850, UCA International Users' Group (IUG) is meeting here in Scottsdale, right after the PSRC meeting.

Old Business

C37.94

Chris Huntley asked about status of the IEC dual logo application for C37.94. After a prolonged discussion it was concluded that another attempt, this time through IEC TC57 may be better.

New Business

HTF2: Configuring Ethernet Communications Equipment for Substation Protection and Control Applications

Chair: E. Udren

Vice Chair: J. Gould

Output: Report

New Task Force was proposed. The topic of equipment configuration becomes important as the use of Ethernet LANs in substations grows rapidly. It becomes critical when the LAN carries IEC 61850 GSE messaging (GOOSE and/or GSSE) for high-speed protection, or sampled data (process bus) messages. Among the topics to discuss for possible inclusion are:

- Switch and router configuration
- VLANs as needed for GOOSE
- Security
- Priority queuing
- Traffic monitoring and control
- Topology choices and redundancy

The goal is to identify if a document would serve the relay application community, define the project, and compose a PAR if needed. The work must coordinate with other application guidance from IEEE, notably P1615 on Recommended Practice for Network Communication in Electric Power Substations.

Need a room for 20 people plus a computer projector for the May meeting.

I: RELAYING PRACTICES SUBCOMMITTEE

Chair: T. Sidhu

Vice Chair: R. Beresh

The Subcommittee met on 10/Jan/07 with 30 members and 21 guests. Minutes from the September 2006 meeting in Atlanta were approved.

Reports from the WG Chairs

I1: Understanding Microprocessor Based Technology Applied to Relaying

Chair: Moh Sachdev

Vice Chair: Ratan Das

Output: Report to the Subcommittee

The Working Group I1, met on January 9, 2007. Four members and twelve guests were present.

Minutes of the September 2006 meeting were approved. Discussions were held about issue – Sukumar Brahma will work with Demetrios Tziouvaras to resolve his comments by March 15, 2007. Updated document will be balloted among working group and subcommittee members.

We will meet at the May 2007 meeting. We need a room for 20 people with a computer projector.

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

I2: Terminology Review

Chair: Mal Swanson

Vice Chair: Barb Anderson

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

The I2 working group met at 11:00 am on Tuesday, January 9, 2007 with eight members and three guests. Mal Swanson chaired the meeting. Minutes from the last meeting were approved.

Since Charles Henville had comments on two definitions from Group #4 that had been sent to the officers for their approval, he attended this meeting. The working group agreed to his revisions.

Mal Swanson reviewed the procedures for having our definitions published in C37.100 and IEEE Std.100. Since C37 has not started a revision on C37.100, Mal has arranged to have the output of the I2 working group put on the PSRC website. Each group of definitions will be on the website with a note explaining where they are in the approval process. After Group #4 receives formal Officer approval, Barb Anderson will email these to Mal so these can be included on the website and be emailed to C37.100.

Group # 5 has been sent to the I Subcommittee for their consensus and comments of substance.

So that each working group member can have a concise list of each term that has been approved by I2, Barb will combine Groups 1 through 6 into a document and email it to the working group.

Gustavo Brunello attended the meeting and discussed IEC definitions that are currently being balloted. Mal said the I2 working group would like to coordinate with this IEC group as much as possible.

The group then reviewed assignments.

C37.234: Oscar Bolado presented an extensive definitions section of this document, which he will revise to include only those terms relating to protection. Oscar will email the revised definitions to Mal, who will email them to the other members of I2 for further review.

C4 Working Group paper: Roger Whittaker presented definitions from this document. The working group reviewed four terms. Roger will rewrite the remainder for brevity and conciseness, and then email them to Mal and Barb.

James Pratt joined the working group.

The meeting was adjourned at 12:45 pm.

I3: Microprocessor-Based Protection Equipment Firmware Control

Chair: Robert Beresh

Vice Chair: Roger Whittaker

Output: Recommended Practice

Working group I3, recently completed PC37.231 "Draft Recommended Practice for Microprocessor-Based Protection Equipment Firmware Control." The WG met Jan, 9, 2007 with 5 members and 4 guests regarding a discussion about how to publicize this newly approved recommended practice. Rick Taylor made a request for the presenters to lead a panel discussion on this topic at the Texas A&M relay conference in March. A summary paper will be written by Bogdan Kasztenny, Ken Fodero, and Bob Beresh. Solveig Ward and Ken Fodero will prepare and lead the panel discussion. Consideration will be given to presenting at a future main PSRC meeting.

I4: IEC Standards Advisory

Chair: Eric Udren

Vice Chair: Mario Ranieri

Output: IEC Standards Advisory

The working group had a lively meeting of 6 members and 8 guests on January 9. The WG has implemented its new strategy for achieving PSRC input to new IEC TC 95 relay standards under development. The branches of this arrangement are:

- PSRC WG for input to MT3 developing 60255-1, Common Specifications
 - ◆ Old 60255-6
 - ◆ Maintenance Team Convenor Paul Millard, UK
 - ◆ Mario Ranieri is working with C37.90.0 WG
 - ◆ Mario's comparison document for 60255-6 sent to his C37.90 WG and WG I4.
 - ◆ IEC draft for 60255-1 should be available for review in February
- PSRC WGs for input to MT4
 - ◆ Maintenance team convenor Dr. Murty Yalla, USNC
 - ◆ 60255-127 under and overvoltage relays
 - ◆ 60255-151 under and overcurrent relays
 - WG by Gabriel Benmouyal, SEL for both of these
 - Bring forward revised 60255-3, derived from C37.111
 - ◆ 60255-121, Functional standard for distance protection
 - To be reviewed by Alex Apostolov WG on standardized distance relay characteristics
 - ◆ Drafts should be available to PSRC in February

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

- Latest Program of Work document 95/195/MCR
- 95/203/NP, Power Frequency Magnetic Field Immunity Tests, 60266-22-8
 - ◆ New project proposal with draft received from Japanese National Committee
 - ◆ Based on IEC 61000-4-8 generic immunity standard. IEC WG Convenor Hachadai Ito was at our meeting to explain changes from generic standard.
 - ◆ Annexes explain real-world basis for test levels – we noted steady state conditions.
 - ◆ US members of SB 1 had previously said they don't see the need for this test.
 - ◆ However, two vendors reported that they perform the tests and find issues in designs.
 - ◆ USNC Vote due by February.
 - ◆ We had treated this as an unnecessary test, but found that manufacturers are doing 61000-4-8 and some find and fix problems, so we vote in favor.
 - ◆ The WG decided that perhaps the IEC basis for levels does not account for levels that could theoretically from fault currents in substations, and the IEC WG should look at this.
- 60255-22-1 – 95/204/CDV 1MHz burst immunity test
 - ◆ Align with 61000-4-18
 - ◆ Most circuits tested at 2.5 kV

- ◆ Test connections for communications circuits at 1 kV has a new and strange arrangement that triggered much discussion.
- ◆ This is different from the capacitive clamp test of the prior version, that IEEE had absorbed.
- ◆ Vote due at end of April 2007.

IEC TC 57 – Power Systems Management and Associated Information Exchange

- ◆ IEC 61850, Communication Networks and Systems in Substations
 - UCA International Users' Group (IUG) meeting at DistribuTECH - see <http://sharepoint.ucausersgroup.org/>.
 - There is a meeting of Technical Committee of UCAIUG at PSRC on Thursday January 11 after PSRC meeting in Scottsdale.
 - UCA IUG Testing Subcommittee is working on definition of station bus client device testing (substation host or concentrator, as opposed to relay which is called a server in 61850). Clients can have conformance tests and can receive certificates.
 - Same Testing SC is looking at how to define a conformance test on Process Bus (61850-9-2) equipment.
- ◆ WG 10 developing approaches for substation to control center and inter-substation messaging under 61850. Next meeting begins on Feb. 6 after DistribuTECH in San Diego.
- ◆ WG 10 and UCA UIG together manage TISSUES process to get unclear points and errors in the Standard fixed as they are found in 61850 implementations.
- ◆ All manufacturers and users are obliged to post problems and solutions in TISSUES process, to keep 61850 as an open and interoperable protocol that keeps its promise.
- ◆ 61850 Revision release plans:

Edition 1+	Edition 2	Edition 3
Interoperability TISSUES	TISSUES - new TISSUES are collected until CDV stage) Basic model extensions (*) - Statistical / Historical - Security aspects from IEC 62351 - Common usable elements from Hydro and Wind standards Domain model extensions (*) - Power Quality Models - Monitoring extensions from IEC 62271-003 Impact of SS-SS communication Testing - Client conformance testing - Tool conformance testing	TISSUES Basic model extensions - Description of programmable scheme logic (in SCL) (over communications) - Network and system management - Common usable elements from DER standard - Redundancy Domain model extensions - Low voltage applications (German Report) - Eliminate IED specific settings Impact of SS-CC communication Testing - System testing?
continuously	CDV 2007 / FDIS 2008	

(*) These are the driving factors

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

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

Group met on Tuesday with 8 members and 1 guest. Draft 4 was discussed. All comments have been implemented and Guide Draft 4 is ready balloting.

WG will work on an IEEE Transactions summary paper.

Final Guide Draft 4 will be available to all PSRC members on the PSRC I-7 WG WEB Site, <http://www.pes-psrc.org/i/I07.html>

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

I8: Guide for Applications of Optical Current & Voltage Systems

Chair: Harland Gilleland

Vice Chair: Bruce Pickett

Output: Guide

The Chair (Harland Gilleland) called the meeting to order 1/9/07 with 18 present (14 members, 4 guests). There were introductions, list of attendees, discussion of corresponding members. Harland passed out handouts that contained an agenda and work assignments and progress outline to date.

TW Cease talked about needing feedback on website.

Loubo Kojovic discussed Rogowski coils section on website.

Bryan Mugalian discussed section 8 on the website and the need for feedback.

Harland asked everyone for reviews of the website. Specific assignments to review were made by volunteers:

Sect 1 Brian Mugalian

Sect 2 John Lane

Sect 4 Bill Dickerson

Sect 10 ABB

Sect 11 Del Weers

Sect 8 Veselin

Due middle of Feb

Made a list of power companies that may have optics installations with possible contacts – see attached list.

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

Chair: Sahib Usman

Vice Chair: Roy Ball

Output: Revision of Standard C37.105

The working group meeting was held on 1/9/07. Four members and two guests attended the meeting.

The outstanding issues to finalize the draft D-11 were discussed.

Most of the negative ballots were resolved.

The changes, additions/deletions necessary to finalize the draft are being incorporated.

Certain writing assignments (for harmonization with IEC Std) need to be completed

We are shooting to issue the finalized draft D-14 for re-balloting, after the next meeting scheduled for May, 2007 in a double session. Draft 9 was distributed and discussed. The remaining negative ballots were discussed and resolved during this meeting. Al Darlington has completed the revision of the Guide's figures and presented them to the working group in both TIF and VISIO format. Once the comments from the resolved negative ballots are incorporated within the Guide, Draft 9 will be submitted to IEEE for a Recirculation Ballot.

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

Chair: Marie Nemier

Vice Chair: Munnu Bajpai

Output: Revision of Standard C37.98

The working group met on 1/10/2007 with two members and due to lack of attendance, cancelled meeting.

I11: Timing Considerations for Event Reconstruction

Chair: Jim Ingleson

Vice Chair: Jim Hackett

Output: Report to the PSRC

We met on January 10, 2007 with 3 members and 21 guests. There continues to be a high level of interest expressed in the report under final revision. Although many members couldn't attend this meeting, a number of them provided their input in advance by helping up date the draft report prior to the meeting.

We reviewed draft 11 of the report, the latest draft which is on the I11 website. Got concurrence on changes made to the two sections (2.5 and 4.2) that needed finalization. and made good progress at getting resolution on some outstanding issues in one section (4.2).

We requested that people provide their comments on the revised draft within two weeks, emailing them to the Chair. The input will be integrated into the report and a new draft posted on the web site within a month. The revised draft of the report will also be emailed to those present at the meeting, requesting feedback on the changes to the section(s) under revision.

The goal is to resolve any outstanding issues prior to the next meeting and to make the final draft of the report available on the I11 web site at least a month prior to the next meeting.

Proposed Report Name: Event Reconstruction Using Data from Protection and Disturbance Recording IEDs (different from the official name of the I11Working Group).

We intend to meet our planned date of May 2007 for completion of the report and will request permission to submit the report to the Relaying Practices Subcommittee at the next meeting.

We seek permission from the Subcommittee to present the draft of our report to the FDA conference in Atlanta on April 30th or May 1st. The conference is interested in a presentation on the work because of the timeliness of the related issues.

Need a room for 25 persons and a computer projector for the next meeting.

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

Chair: Mike Meisinger

Vice Chair: Don Sevcik

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

Working Group I12 met on the afternoon of January 9, 2007 with 6 members and 1 guest. Mike Meisinger lead a discussion regarding copy right of all material used in the document and informed the group that, at the last minute, IEEE had requested that new release documents be obtained for figures/pictures in this guide that ABB had provided and that Harley Gilleland obtained them. As a result, RevCom has approved the guide and it is ready for publication. The attendees then discussed the items that should be included in the summary paper of the guide revisions that will be prepared by this working group.

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

Chair: John Tengdin

Vice Chair: D. Holstein

Output: Revision of Standard C37.2-1996

Sixteen members and guests attended (four from PES Substations)

The Chair announced that liaison is being established with the IEEE Industry Application Society's Power System Protection Committee (IAS/PSPC).

Reviewed Eric Udren's proposal for Device 16. Concluded that the suffix letters of E for Ethernet devices and S for serial devices were superfluous. Also concluded that we need some example one line diagrams using the proposed Device 16 and suffixes to see how workable this proposal might be. Several in

attendance volunteered to submit examples to the Chairman prior to the PES Substations meeting April 16 – 19, 2007.

No change was identified for the proposed cross reference to IEC 61850 logical nodes

No change was identified for the proposed changes to the present C37.2 suffixes

Consensus was reached that a definite time overcurrent relay should be represented by 50TD, and so defined in PC37.2.

Concern was voiced that, in addition to adding device # 16, there are other high priority functions not now represented by function numbers – i.e., the device which produces synchrophasor data, the device that provides power quality data, the device that provides a timing source for substation events. The Chair was asked to review with IAS/PSPC the proposed future obsolescence of device numbers 22 – equalizing breaker, 58 – rectification failure relay, 70 – rheostat, 93 – field changing contactor (and perhaps others) to see if they might be freed up during this revision.

The next meeting of Substations WG C5 will be during the PES Substations Annual Meeting in Bellevue, WA (Seattle area) and most likely on April 18.

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

Chair: George Moskos

Vice Chair: Barry Jackson

Output: Revision of Standard C37.110-1996

The working group met with 5 members and 5 guests in a double session. Draft 9 was distributed and discussed. The remaining negative ballots were discussed and resolved during this meeting. Al Darlington has completed the revision of the Guide's figures and presented them to the working group in both TIF and VISIO format. Once the comments from the resolved negative ballots are incorporated within the Guide, Draft 9 will be submitted to IEEE for a Recirculation Ballot.

I17: Trends in Relay Performance

Chair: W.M. Carpenter

Vice Chair: J.D. Wardlow

Output: Special Report

The working group did not meet.

ITF1 Manufacturer's Service Letter Database

Chair: Jerry Jodice

Vice Chair:

Output: Service Letter Database

Since the September meeting I have added one (1) item to the RELAY SERVICE LETTER DATABASE, and have updated the ITF1 web page accordingly. This item was a Basler Electric "Product Advisory" Number 9252090005, on the BE1-50/51 relay

ITF2 Anomaly Checks for Relays

Chair: Peter McLaren

Vice Chair:

Output:

The task force met with 14 people present. The chair explained the issue at stake and gave a short presentation of the project in which he had become aware of the vulnerability of relays and other substation apparatus to hackers who gain access to the communication networks and get past the security measures (badly chosen passwords, etc.) to the relay settings. Once in contact with the relay the hacker (who probably has little power system knowledge) can insert settings which make no sense to a relay engineer

and this might be a way of detecting that an intrusion had taken place. There was then a discussion about the feasibility of a rule based methodology to be employed in the process of compiling the requested settings for download to the relay. Some typical rules, such as Z1<Z3 for a distance relay, were mentioned but this particular rule might not be true in an over-reaching scheme. If there was a viable rule base either the manufacturer or the user would have to write a macro for use in the compiling process. If manufacturers were to offer this then the cost of the relay would increase. Utilities had neither the time, money nor manpower to undertake this task and they were further concerned that the presence of such a macro might restrict the freedom of operators in an emergency situation. There was also mention of the situation that as relays, controls, communications, instrumentation etc. were becoming more sophisticated, relay engineers/technicians were under greater pressure and SCADA operators were becoming less skilled. Wrong settings could also be caused by errors made by legitimate personnel with access to the relay. We might want to consider a survey to see how utilities presently deal with this problem. Another WG, C1 (Cyber Security Issues for Protective Relaying) was already dealing with the communication and process aspects of the problem.

The meeting agreed that the task force should meet again at the May meeting in Nashville and should focus on the feasibility of a solution and making the relaying community more aware of the problem.

1. **Addendum**

Subsequent discussions with people not at the meeting revealed that some manufacturers have “Intelligent configuration software” and that under the “Models” description there will be limits on the range of a setting (e.g., max/min) and possibly other restrictions including various levels of access. The chair will endeavor to get more information on these measures and invite additional members with such knowledge to attend the next meeting.

ITF3 **Application of Testing of relaying Equipment**

Chair: Jerry Jodice

Vice Chair: Moh Sachdev

Output: Report to PSRC

Discussion was active and pursued a range of possible approaches to develop a productive assignment for SC I review with the objective of attaining WG status.

Commentaries leading to action items included:

- The Chair suggested the TF scope be modified to specifically address Application Testing for “malfunctioning/misoperating” protection.
- C. Henville commented on the need for members to become familiar with the work of other complementary/potentially conflicting PSRC activities, most especially C11, C12, and DTF22. Chair will attend C, D, and I SC meetings. Objective is to obtain Assignments, current output documents for circulation to TF3 participants.
- J. Jodice commented on the importance of developing a vocabulary based on prior IEEE/CIGRE work [which has been distributed to November meeting participants with the Minutes]. Copies will be circulated to January meeting participants with TF minutes.
- K. Zimmerman shared a flow chart which provides an ordered approach to determining “what happened” and root cause misoperation. This document will be circulated to all participants, and subsequently used as trial horse for the original NPCC activity which resulted in the formation of this TF.
- B. Gwynn will provide materials defining conditions experienced during that system event.
- Chair will circulate the 1986 CIGRE report [which proceeded SC34.10 already circulated]. Peter Crossley offered to provide copies of the 1986 CIGRE report. Articles from “ELECTRA” will also be circulated to round-out reference materials.

Debate will continue on the TF assignment at the May meeting.

ITF4 **Reaffirmation of C37.90.3, Electrostatic Discharge Testing**

Chair: J.G. Gilbert

Vice Chair:

Output: IEEE Standard

The Standard has been affirmed and the TF will no longer meet.

Coordination Reports

Liaison Report from Instrument Transformer Subcommittee
From: Del Weers

Working Groups activity in progress includes the following:

C57.13 - IEEE Standard Requirements for Instrument Transformers
The PAR to Review IEEE Std. C57.13 -1993, expires 12/31/2007

C57.13.5 - Standard of Performance and Test Requirements for Instrument Transformers of Nominal System Voltage 115 and Above

The PAR for Revision requested in October 2005 was approved C57.13.5 is a Reference Trial Use Std published in 2003 Consideration for changing to a standard is implied.

A couple of IEC standards are being circulated for review.

Old Business

New Business

Solveig Ward proposed that a new Task Force be formed to deal with redundancy. A new Task Force was commissioned as ITF5 and this will meet at the net meeting in Nashville.

J: ROTATING MACHINERY PROTECTION SUBCOMMITTEE

Chair: W. G. Hartmann

Vice Chair: K.A. Stephan

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

Reports from the WG Chairs

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

Chair: J. Gardell

Vice Chair: P. Kumar

Output: Report to the Main Committee

Meeting #12

J1 met for a double session with 13 members and 5 Guests. This was the 12th meeting for the group.

Draft 4, sections 7 to 9 of report was reviewed. Sections 1 through 6 were reviewed at the previous meeting in Atlanta. This completed the first full review of document after all sections had been completed.

The major comments were from some drive suppliers, in effect to make the overall document more comprehensive in its coverage. Some of the examples are: ASD applications with bypass contactors, applications where drive is directly connected to source without isolation transformer, synchronous transfer with multiple motors, protection with current limiting fuses. The major new assignments were to be completed by Chris Ruckman and Tom Farr.

Matt Basler provided a list of common protections provided by drive suppliers. This list will be sent to some selected drive suppliers for concurrence

All assignments are due on Feb 15th. The chair will incorporate all assignments and send them to members to review document before next meeting.

The next session will be a double session with computer projector, 25 attendees.

The following are the writing assignments:

- Tom Farr to a) add in section 7 write-ups on current limiting fuses b) bypasses contactors. and c) synchronous transfer d) to add in section 4 advantages of higher harmonic in drives and discuss levels.
- Tom Farr and Wayne Hartman in section 7 to include other over current protection usages such as unbalance, negative sequence for motor protection.
- Tom Farr and Chris Ruckman to provide one line of major system configurations. Wayne Hartman will provide a conceptual one line to Tom and Chris
- Tom and Zeeky to confirm with drive suppliers “drive protections” included in text as being accurate.
- Chris Ruckman to a) revise section 7 of document.,b) revise statement in document where reference is made to drives connected to source without isolation transformer.c) to cover in section 7,motor relay performances to be adequate at various frequencies
- Prem to a) modify section 7 to remove recommendations of using adaptive settings due to difficulty in obtaining data b) Modify annex to remove nuclear project specifics and references.
- Dale Fredrickson to provide correct EPRI reference for bibliography section

J2: Protection Considerations for Combustion Gas Turbine Static Starting

Chair: Mike Reichard

Vice Chair:

Output: Report to the Subcommittee

Fourth Meeting

Introductions, 10 members, 11 guests

The Task Force reviewed and approved the May meeting minutes.

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

Introductions, 9 members, 2 guests

The WG reviewed and approved the September 2006 meeting minutes.

The WG developed an outline for the paper as follows:

- i) Introduction (description of static starting to include time line sequence)
- ii) Categories of machine grounding methods during static start
 - (1) High-Resistance Grounding with resistor
 - (2) High-Resistance Grounding with neutral grounding transformer and secondary resistor
 - (3) Ungrounded
- iii) Short Circuit Characteristics
- iv) Key Protection Elements and Considerations
 - (1) Protection Used During Static Start
 - (a) Low Frequency Response
 - (b) Specific Protection Applications
 - (i) Differential
 - (ii) Phase and Ground Protection
 - (iii) Volts per Hertz
 - (2) Protection During Normal Operation
- v) Drive Mechanism Protection

Assignments to WG members, referring to the outline in 3., are as follows:

- i) Mike Reichard
- ii, 1) Wayne Hartmann and Pat Kerrigan
- ii, 2) Wayne Hartmann and Pat Kerrigan
- ii, 3) Zeeky Bukhala
- iii) Mike Reichard
- iv, 1) Wayne Hartmann (one-line)
- iv, 1, a) Dale Finney and Murty Yalla
- iv, 1, b, i) Pat Kerrigan
- iv, 1, b, ii) unassigned

- iv, 1, b, iii) unassigned
- iv, 2) Wayne Hartmann (one-line)
- v) Jon Gardell

Assignments are due by April 15, 2007.

Zeeky Bukhala was nominated for Vice Chair of the WG

The target completion date for the paper is May 2008.

J3: Protection of Generators Interconnected with Distribution System

Chair: E. Fennell

Vice Chair: R. Pettigrew

Output: Report to the Main Committee

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

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

J4: Revision of C37.102 AC Generator Protection Guide

Chair: M. Yalla

Vice Chair: K. Stephan

Established 2000

Output: Guide

Expected Completion Date: 2006

Status: 19th meeting

The Working Group did not meet this session.

J5: Generator Protection Setting Criteria

Chair: C.J. Mozina

Vice Chair: M. Reichard

Output: Paper

Introductions, 8 members, 10 guests.

The chairman reviewed the status of the WG Transaction Paper, which has been successfully balloted by the WG, Subcommittee and approved by the PSRC officers.

A draft copy of the paper was submitted for presentation at the 2007 PES General meeting in Tampa.

After the Sept. WG meeting the chairman received an E –mail for the chairmen of the Excitation Subcommittee (Om Malik) of the EDGPC (Power Development and Power Generation Committee) of the PES who had got a copy of the Sept. draft of the paper and had a number of comments. The entire WG meeting was spent going over these comments and the resulting changes to the paper to address them.

The chair will make the require changes to the paper and submit the paper for presentation at the 2007 PES meeting. Due date for the final paper submission is Jan. 15.

There was spirited sub-committee discussion on SSSL and the graphical method's adequacy as questioned by a reviewer of J5's paper. It was generally felt that the graphical method is conservative and appropriate considering this Committee's purpose to provide the ultimate insurance of protecting power equipment by using protective relays.

Sub-committee may want to consider a liaison with EDPGC

J5 will make a presentation to the PSRC Main Committee meeting in May 2007.

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

Chair: J.T. Uchiyama

Vice Chair: R. Das

Co-Vice Chair: Mike Reichard

Output: Revised Guide

WG J7 has completed their assignment. The revision of C37.101 has been approved by RevCom. The Working Group did not meet this session.

JTF1 Motor Bus Transfer

Chair: Jon Gardell

Vice Chair: Dale Fredrickson

Output: Transactions paper or report

Third Meeting, 1/10/2007:

Introductions, 10 members, 6 guests

The Task Force reviewed and approved the September meeting minutes.

Russ Patterson presented event data for motors tapped from a 161kv line, describing motor behavior during source disconnection, voltage decay, and reenergization. The measured response of motors was an excellent example for motor bus transfer applications.

The Task Force decided that the paper would be written to be useful in both generating station and industrial plant applications.

Writing assignments completed for five of the eleven topics previously identified were discussed. This included conditions prior to and just after the main supply breaker opens, modeling and simulation techniques, the 1.33 pu volts per Hertz criteria, and the limitations of traditional synch-check relays.

Assignments were made to continue the effort. Tom Beckwith; Mike Reichard, and Dale Finney volunteered to assist. A vendor may be invited to make a presentation on simulation software at the next meeting.

JTF1 requests elevation of status to a Working Group.

By recommendation by the chair, the sub-committee motioned and voted to elevate the task force standard to a working group. It is now working group J9

JTF2 Generator Tutorial Revision

Chair: Dave Zinn

Vice Chair: Wayne Hartmann

Output: Tutorial

The Task Force met with 20 attendees: 15 members; 5 Guests.

The assignment was presented to the group as being to review the original Generator Protection Tutorial (95 TP 102), "IEEE Tutorial on the Protection of Synchronous Generators" and determine if it requires revision. The original Guide was based on documents that have all undergone revision, specifically - C37.101, 102, and 106. The original Tutorial was also published in 1995.

After the group discussion additional documents were brought to light that should be used for this next revision:

- J5: Generator Protection Setting Criteria Transactions paper by Charlie Mozina.
- Settings examples were not included in the Sections of the original document
- J6 information on *The Effects of System Disturbances on Generator Protection*
- Include paper addressing 'Sequential Tripping'
- Elaborate on mechanical issues that lead to relay tripping in **Section 14**, specifically '**64F Target.**'
- Utilize Turbine Generator Operation, Performance, and Maintenance Standard developed by Electric Machinery Committee.

- (Review C37.114 (Breaker Failure) and identify those areas that directly relate to Generator Protection.

The Task Force members agreed that there is enough new information to recommend to the Subcommittee that a Working Group be formed.

Working Group Chair will communicate with PSRC officers on to interact with PES for possible Tutorials delivery/dissemination. In doing so WG will create mechanism for Tutorial revision dissemination.

The current version of the IEEE Tutorial is over 10 years old and also out of print.

Chair & Vice Chair will work to secure relevant documents for dissemination to future Working Group participants.

Chair will work to identify with Chuck Mozina and Jon Gardell for liaison contacts for Excitation & Electric Machinery committees.

Subcommittee motioned and voted to elevate the task force standard to a working group. It is now working group J8 with Dave Zinn as chair and Wayne Hartmann as vice-chair.

Liaison Reports

Electric Machinery Committee

C.J. Mozina

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

IAS I&CP Committee

C.J. Mozina

The next meeting of the I&CPS committee is in May 2007 in Edmonton, Canada.

Revisions of the Buff Book (IEEE Std. 242) – Progress continues to be slow due to the selection of specific Buff Book material to be removed from the Buff Book and incorporated into the “Rainbow or General Book” has not been agreed upon. New chapters will be added on Distributed Generation and Telecommunication within industrial facilities. Assignments were made to review selected chapter and to identify revisions.

Grounding & Ground Fault Protection of Medium Voltage Generators Working Group - The last set of EMTP hybrid grounding study results were reviewed. No real surprises in cases run to date. The outline for the transaction paper was developed and writing assignments made. The paper will highlight the EMTP study results and will address equipment requirements to implement hybrid grounding. A first draft is expected by the next WG meeting in May 2007. A tentative date for the IAS paper, which will publish results, is May 2008.

Nuclear 1E WG

No activity to report.

NERC

A number of *backup* generator protection relays operated for the 2003 blackout. Joe Uchiyama is writing a report for NERC and would like assistance from J sub-committee.

Inadvertent, V/Hz, 21 distance, etc. were claimed to have operated during the blackout to trip units off.

Coordination Reports

None

Old Business

J4 (approved by Revcom) has been reviewing the publishing editors' comments.

New Business

A task force was created at Joe Uchiyama's request to assist him in his report for NERC. The Generator Backup protection NERC response task force JTF3 was created. Joe Uchiyama is the chair.

Subcommittee motioned and voted to create a new working group to reaffirm C37.96. Prem Kumar volunteered for chair, Dale Finney volunteered for vice-chair.

Dale Finney and Dale Fredrickson have been appointed members of J SC

C37.106 Reaffirmation is coming up. Be thinking about possible revision items with this guide.

J SC needs a webmaster. Steve Conrad volunteered.

Do we need to consider a generator protection survey? This was discussed last meeting as well but was raised again this meeting and it was noted that even though multi-function devices are now available, some locations, such as nuclear plants, still require redundancy. Many traditional companies no longer own generation. Often consultants are used for the protection engineering by the new owners of generation. Topic was tabled for now since we formed a working group to update the generator tutorial, and we have addressed redundancy in a previous paper.

There may be some interest in this subcommittee doing work on pumped storage applications and utilizing microprocessor-based protection. This committee did a great paper about 20 years ago. Tabled for now but plan to relook at this in September.

In-Service Aberrations

A pumped-storage motor question was sent to the chair for consideration. We will ask for more information from the provider before bringing it before the subcommittee.

Old Business

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

New Business

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

K: SUBSTATION PROTECTION SUBCOMMITTEE

Chair: F. P. Plumptre

Vice Chair: P.G. Mysore

The Subcommittee met Wednesday January 10 2007, in Scottsdale, Arizona with 16 members and 23 guests attending. The minutes of the previous meeting in Atlanta, GA were approved.

ITEMS OF INTEREST FROM THE ADVISORY COMMITTEE MEETING:

None.

Reports from the WG Chairs

K1: PROTECTION OF TRANSFORMERS AGAINST FAULTS AND ABNORMAL CONDITIONS

Chair: Mohindar Sachdev

Vice-Chair: Pratap Mysore

Established: 2003

Output: Revision of IEEE C37.91-2000

Expected Completion Date: 2007

The Working Group K01, Protection of Transformers Against Faults and Abnormal Conditions, met in the Atlanta B Room, Renaissance Atlanta Hotel, Atlanta, GA at 08:00 AM on Wednesday, January 10, 2007. Ten members and eleven guests were present.

Pratap Mysore, vice-chair, chaired the session in the absence of Dr. Mohindar Sachdev. The vice-Chair updated the attendees about the status of the draft 7.0 that was balloted: Approve: 178, Disapprove: 12, Abstentions: 20. Total Number of Comments received were 478 out of which 289 were editorial; 123 were technical and 66 were general comments. This approval percentage (84%) exceeded the needed 75 % approval rate.

The chair, Mohindar Sachdev has addressed comments from nine balloters who voted negative and has confirmation from nine negative balloters that they are satisfied with the changes suggested on behalf of the WG and would approve the guide when recirculated with those changes. For the remaining three negative ballot response, WG response has been sent out to two. The chair is unable to contact the twelfth balloter who is away on vacation. The chair is addressing the comments received from balloters who approved the guide.

The revised guide, draft 8.0, incorporating the changes will be sent out to the WG members by the end of January 2007 for quick review before recirculation. The WG members were concerned about the quick turn around of the draft 8.0 review and requested more time.

The next discussion was about the output of a summary paper and a transactions paper. The WG members suggested presentations at regional conferences over transactions paper. Roger Hedding will prepare an outline and forward it to Mike McDonald, Bruce Pickett and Pratap Mysore for review. The outline will also be sent to Mohindar Sachdev.

Discussed Figure 17 of the draft 7.0 on sensitive ground protection. WG decided to keep it in and correct neutral connection.

At the conclusion of this business the meeting was adjourned.

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

Chair: Bruce Pickett

Vice Chair: Tarlochan Sidhu

Established, 2002

Output: Paper

Draft 8.0

Meeting not held.

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

Chair: Simon Chano

Vice Chair: Dean Miller

Established, 2005

Output: Report to the PSRC

Draft 1.0

The WG met on Tuesday morning, January 9, with 12 members and 3 guests present. Roger Whittaker presented his completed writing assignment on Application of Other Control Functions. This clause for the report covers: manual controls, both local and remote; synchronism check; 27/59 functions; lockout; and point on wave switching. Roger's presentation initiated an extensive discussion on the application of multi-relay packages with the same function controlling the same breakers. Roger will be modifying his writing assignment to cover these issues in his clause.

Roger Whittaker and George Gresko accepted a writing assignment to complement the 3B clause on automatic reclosing. This assignment and the other uncompleted writing assignments will be due by mid March.

Two other newly completed writing assignments that we did not have time to discuss at this meeting were distributed. These were 4A & B clauses on Maintenance and Testing Issues by Bruce Mackie, and 4C clause on Documentation by Fernando Calero.

K6: SUDDEN PRESSURE RELAYING

Chair: Randy Crellin

Vice Chair: William Gordon

Established:

Output:

Expected Completion date: 2008

Status:

The working group met on Tuesday morning, January 09, 2007 for the fourth time in a single session with 3 members and 5 guests. One of the guests requested to join the working group, which currently has 15 members.

Bill Gordon welcomed everyone to the meeting and then started the meeting off with a

Discussion of the working group notebook: Bill stated that all of the writing assignments have been completed and then discussed what the writing assignments were.

The group then discussed the outline for the technical paper and agreed that it would follow the same outline as the original writing assignments. It was also agreed that the supplied technical papers would be included as appendices to the working group technical report. Frank Plumtre offered to provide a sudden pressure technical paper that was presented at the WPRC by Gary Young of BC Hydro. Bill is to discuss the SPR survey conducted by Charlie Sufana with Charlie for possible inclusion in the technical report.

Don Lukach volunteered to compile the writing assignments into the first draft of the technical report. Bill will review and distribute the first draft to the working group membership.

K7: GUIDE FOR THE PROTECTION OF SHUNT REACTORS.

Chair: Kevin Stephan

Vice Chair: Pratap Mysore

Established, 1999

Output: Revision of ANSI/IEEE C37.109

Expected Completion date: 2006

Status: Reviewing Draft 15

The Working Group did not meet this session.

The draft standard PC37.109 was approved as an IEEE standard revision by RevCom in December. The guide is presently with the IEEE publication editors and the Chair and Vice Chair will review the editorial changes the first two weeks of February 2007. Publication is expected by mid-year.

K8: GUIDE FOR THE PROTECTION OF SHUNT CAPACITORS

Chair: Pratap Mysore

Vice Chair: Arvind Chaudhary

Established, 2006

Output: Revision of IEEE C37.99

Expected Completion date: 2011

Status: Assignments to review clauses in the existing guide

The working group met in one session on Tuesday, January 9, 2007 with thirteen members and five guests in attendance.

Bogdan Kasztenny gave a presentation titled "Fundamentals of Adaptive Protection of Large Capacitor Banks". The power point presentation and copies of the slides will be added to the website.

Meeting minutes of the September Meeting in Atlanta was not sent out, as the word copy of the existing guide is still not received from the IEEE board. Assignments made at this meeting required members to review different clauses in the existing guide. IEEE is trying to expedite the process.

The Project Authorization Request (PAR) was submitted to the IEEE on January 3, 2007. New standards Committee (NESCOM) will review the PAR application during the March 2007 meeting.

There was a discussion on one of the negative ballots received commenting on higher TRVs due to the use of current limiting reactors. This will be discussed at the next meeting to determine the additions required in the guide. The negative ballots spreadsheet will be distributed to the working group members.

The next meeting will have a short presentation by John Harder on “the protection of neutral current transformer inputs to microprocessor based unbalance protection relays” followed by discussions.

It is intended to have presentations in next few meetings on protection methods that are not covered in the existing guide.

K9: ARC FLASH

Chair: Karl Zimmerman

Vice Chair: Roger Hedding

Established: 2005

Output: Technical report

Expected Completion Date: 2008

Working group K9 met on Tuesday afternoon with 13 members and 12 guests. D. Tziouvaras and P. Kumar joined the Working Group.

After introductions, Draft 2.0 of the document was reviewed. There was a lively and fruitful discussion of the document. The author(s) of each section presented their contribution and discussion ensued. Some modifications to the document were discussed:

- Section 1.0 Introduction: Add voltage levels and mention that paper applies to both indoor and outdoor applications (R. Hedding).
- Section 2.0 Definitions were discussed, consensus to use industry definitions from existing documents (e.g. IEEE 1584, NFPA 70E). Coordinate new definitions with Definitions WG.
- Section 3.0 Summary of Applicable Standards: Add NESC to list. (M. Basler)
- Section 4.0 Summary of Non-Protective Relaying Approaches to Mitigate Arc Flash Hazard: Change title of section, exchange with section 5. (Make section 4.0 “Section 5.0” and vice versa.) Organize subsections to three items: solutions that reduce current, solutions that reduce time, and solutions that reduce hazard. Add resistance/impedance grounding as a method of reducing fault current levels. (C. Ruckmann)
- Section 5.0 – re-organize as Section 4.0. Add optical sensors to summary table. Add application of core balance cts for ground protection on impedance grounded systems. (D. Tziouvaras)

All sections are to be reviewed/revised by original authors.

P. Kumar will review Appendix A, Arc Flash Analysis.

Writing assignments are due April 15.

Roger Hedding made a very well received presentation on optical recognition of arc flash at the January meeting. The WG expresses much thanks to Roger.

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 Jan 9, 2007 with 5-members and 4-guests. There has not been a main 1547.x meeting since August 2006, so my report from the Sept 06 meeting changed very little. The next 1547.x meeting is scheduled for the week of January 29 in Atlanta. The 1547.2, Draft Application Guide, working group had three Web Cast meetings since August and the minutes were forwarded to the K10 members. The results of those meetings along with what we accomplish in Atlanta will be posted as Draft 6 of 1547.2 on the SCC21 Web site. I will notify the K10 membership when this occurs.

Frances Cleveland from Xanthus Consulting attended our meeting and is a member of 1547.3 working group Guide for Monitoring and Information Exchange. She reported that the working group has finished its assignment but is not sure where the document is located at this time. I will find out at the Atlanta meeting.

- 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" (Complete but where is it posted?)
- P1547.4 "Draft Guide for Design, Operation and Integration of Distributed Resource Island Systems with Electric Power Systems"
- P1547.6 Recommended Practice for Interconnecting Distributed Resources With Electric Power Systems Distribution Secondary Networks" Joe Koepfinger, Chair; Tom Basso, Secretary

There were several questions about the status of P1547.5 which will deal with units larger than 10MVA connected to transmission lines, but at this point I have no information nor do they meet with the rest of the 1547.x working groups. I will try and get an update from SCC21 leadership at the Atlanta meeting.

If you have special interest in the progress of a particular working group or would like to provide input, let me know and I will supply the appropriate password to get to the latest draft.

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

Chair: Frank Plumptre

Vice Chair: Dan Hamai

Established, 1999

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

Expected Completion Date: 2006

Draft 9.3

K13 met with 4 Members and 3 Guests in attendance. The meeting basically consisted of an information session/progress report to members with the following report (prepared by Dan Hamai, vice chair) read out at the meeting.

"WG K13 Members:

Here is an update for PC37.116 "Guide for Protective Relay Application to Transmission-Line Series Capacitor Banks."

Following discussions from the WG in September, comments from the re-circulation were addressed and the Draft was finalized. The package was sent to RevCom in time for the October deadline.

Preliminary comments from RevCom were addressed by e-mail in November.

PC37.116 was reviewed by RevCom at its December 5, 2006 meeting.

On December 6, I received an e-mail from RevCom stating that PC37.116 was conditionally approved as a new guide by the IEEE-SA Standards Board.

The conditions must be satisfied by February 9, 2007 in order to obtain Final Approval.

The recommendation was to approve conditional to the resolution of legal counsel concerns to the satisfaction of legal counsel. My understanding from discussions with IEEE is that there were some concerns about using absolute dollar amounts in Annex C. According to IEEE, we will be given a PAR extension if we need to address any of these issues in February.

All of this is very encouraging in approving our Guide. Thanks to all of you for your help in getting this Guide together. I will keep you informed of any updates from IEEE

In response to possible changes in Annex C, Dean Miller, who prepared this Annex agreed to make changes if so required.

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

Chair: Bogdan Kasztenny

Vice Chair: Steve Conrad

Established, 2005

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

Expected Completion Date: 20xx

Draft 2

The K14 Working Group met on January 10, 2007, in Scottsdale, AZ with 17 members and 19 guests in double session. The minutes of the September 2006 meeting were approved as printed.

Bogdan Kasztenny reviewed the status of the guide to date and strongly encouraged those who have writing assignments to be sure to submit them to him quickly.

The definitions section should be looked at to consider eliminating definitions that may be found elsewhere (i.e. IEEE-100 etc.) or adding new terms.

Damien Tholomier and Phil Beaumont agreed to review Clause 4 – Bus Arrangements. There was a great deal of discussion on the structure of the overall document. Generally the thought was that the arrangement of Clause 4 and 5 may be swapped. Bogdan encouraged everyone to wait till after the writing assignments have been expanded and cleaned up before moving any material. The thought was to arrange Clause 4 to discuss the bus and CT arrangements and to avoid placing secondary circuits in the CT at this time. Bogdan will review section 5 in order to move on with the harmonization of sections 4 and 5.

Clause 6 - There is concern that some of the material is already addressed in the CT Application Guide, which is in process, and that some of the information may be better if placed in the annex. Three writing assignments were made to discuss Introduction of CT (Chaudhary), The IEC Method of Classifying CT (Chaudhary) and CT Saturation issues (Thompson).

Clause 7 - Writing assignments were agreed to by: Thompson – 7.1.1; Kasztenny - 7.1.2; Conrad- 7.3. The WG, relay manufacturers in particular have been encouraged to review section on Advanced Techniques, and expand it as required. A suggestion was made that this may be moved to an Annex. Mike Thompson identified some benefits of keeping the material in the main body.

The second session consisted of a presentation by Lubomir Kojovic addressing the time to saturate of CTs. The PowerPoint presentation will be added to the K14 website.

Arvind Chaudhary also discussed the joint input from John Horak and himself concerning clause 6.

All writing assignments are due to the Chair by March 15, 2007.

Liaison Reports:

There was nothing to report on these reports except for two items mentioned for Transformers committee. Two documents under development/ revision are Dissolved Gas analysis guide and Transformer monitoring. It was suggested that the relevance of reporting on these items needs to be reviewed, as well as confirming the individual responsible for reviewing the item. In addition, there may be new items/proposed documents where liaison is relevant for example, the activities of the Substation Technical committee in PES.

Simon Chano agreed to provide liaison with Capacitor T & D sub committee.

John Harder will be coordinating K8 working group activities with the Capacitor T&D sub committee.

Old Business:

Chair requested subcommittee members to review the list of Liaison/ coordination reports and report back to him at the next meeting.

New Business:

The Subcommittee members thanked Charlie Sufana for his leadership as the past chair of the subcommittee.

Charlie agreed to continue as the subcommittee web coordinator.

Reaffirmation of C37.112 -IEEE Standard Inverse-Time Characteristic Equations for Overcurrent Relays: 119 ballots (81.9%) were received with 100% approval. Comments received during reaffirmation such as why 37 number is used for the standard were discussed. It was decided not to have a task force to consider a revision as there were no reported changes in the characteristic equations.

C37.95 - IEEE Guide for Protective Relaying of Utility-Consumer Interconnections is due for reaffirmation. Frank Plumtre will check with the standards coordinator to start the reaffirmation process.

C37.108 - IEEE Guide for the Protection of Network Transformers is also due for reaffirmation. Charlie Sufana will assist Frank Plumtre in starting the process.

Pratap Mysore requested all working group chairs to send an updated list of members of their working group at the earliest.

VII Presentations:

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

A	Synchrophasors (WG H11)	Ken Martin
B	Relay Engineering in Power Engineering Curricula (WG C6)	SS Venkata

Future Meetings:

May 14-18, 2007	Nashville, TN
September 17-20, 2007	Charlotte, NC
January 7 – 10, 2008	San Antonio, TX
May 12-14, 2008	Kansas City, MO

IX. The meeting was adjourned by Chairman Charlie Henville.

Appendix A

PSCC Meeting Report

Cleveland

Minutes of the PSCC Meeting

Agenda

1. Introduction of Members and Guests
2. Approval of Minutes of 2006 General Meeting
3. Topics to be added under 8. "Other Business":
4. Chairman's Comments (F. Cleveland)
5. Technical Session Reports
6. Subcommittee Reports
 - A. Bibliography, Education & Recognition TBD
 - B. Power Line Carrier R.E. Ray
 - C. Radio TBD
 - D. Fiber Optics TBD
 - E. Wire Line P.E. Pool
 - F. New Concepts M. Chaturvedi

- G. Communications Standards M. Chaturvedi
 - H. Security Risk Assessment F. Cleveland
 - I. Broadband Powerline Carrier T. Burns
7. Liaison Reports
- . SCC36 And UCA. Technical Sessions Committee D. E. Nordell
 - B. PES Awards Committee D.J. Marihart
 - C. Power Engineering Education Committee J. E. Newbury
 - D. Power System Relaying Committee R.E. Ray
 - E. Standards Coordinating Committee M. Chaturvedi
 - F. PSEC Demand Side Management Subcommittee D.E. Nordell
 - G. EPRI Joe Hughes
 - H. UTC D.J. Marihart
 - J. CIGRE Göran Ericsson
 - K. IEC TC 57 (Power System Control/Comm)
 - M. IEEE/USA Communications & Information Policy S.A. Klein
 - NA User's Group D.E. Nordell
8. Other Business:
- A. DySpan
 - B. Future Plans for PSCC
9. Future Meetings
- A. 2007 General Meeting – June 24-28, Tampa
 - B. 2008 Joint Technical Committee Meeting
 - C. T&D Exhibition And Conference April 2008, Chicago
 - D. 2008 General Meeting, July, Pittsburg
 - E. 2009 General Meeting, July 26-30, Calgary

Minutes of PSCC Main Meeting

1. **Action:** Secretaries should “hound” the subcommittee chairs to provide reports right after the meetings, not just before the next meeting.
2. Minutes of June 2006 were approved
3. Subcommittee Reports
 - a. Bibliography: The list of all papers published by the PSCC should be listed and posted on the PSCC web site.
 - **Action:** Frances will work with John Newbury (who is the editor of the Transactions) and Dan Nordell (who is TCPC) to determine which papers should be included.
 - b. **Power Line Carrier:** Roger Ray – rewriting the C93 standards
 - Working on oldest ones first C93.4
 - C93.1 CCVTs Couple Capacitor Voltage transformer
 - C93.3 : line traps
 - C93.5 : Terminal equipment
 - Next meeting will be in Nashville
 - c. Radio Subcommittee: Don Marihart
 - Frances Cleveland on P1777 – Wireless communications for power system operations
 - Joint working group with PSCC and Substations
 - First meeting held where the scope was discussed, the draft questionnaire was reviewed, and the outline of the recommended practices document was reviewed and updated.
 - Substantive comments of questionnaire to make it simpler
 - All sections of the recommended practices
 - The real-world experience of Hydro Quebec will be of great help in developing these recommended practices
 - d. Fiber optics – no report. PSCC needs to find a new subcommittee chair, since Bob Bratton retired
 - e. Wireline: Percy Pool on P1590
 - Also had input from Ontario Hydro to provide “real-world” experience of even blowing up equipment to give actual results
 - f. New Concepts – Manish Chaturvedi, meeting led by Frances
 - Group reviewed the list of possible topics and made comments on what to do next on them
 - One area of interest is impact of distributed generation on power system operations, such as the possible need for dynamic relaying. These all have communication requirements.

- g. Communication Standards – Manish Chaturvedi - No report
- h. Security Risk Assessment – Frances Cleveland
 - This subcommittee can be used for education, but the risk assessment document has been stagnant
 - Security is a moving target
 - FERC may not accept the NERC CIP002-009
- i. Broadband Power Line Carrier (BPL) – Terry Burns
 - One WG (P1675) on hardware to protect the utility from any impacts from BPL
 - Second WG on how to measure EM emissions
 - Both WGs will meet in Las Vegas Feb 28-29, and will probably go to ballot after that meeting
 - 200 Mbps is the current state-of-the-art, but gigabits might be possible
 - Next steps:
 - Sit and wait to see where the industry goes
 - Determine what is in it for utilities: how utilities might use it
 - Presentation on BPL at next New Concepts Combo session? John and Terry to take this on.
- 4. Liaison Reports
 - a. BPL Liaison: P1901 under ComSoc group is trying to develop MAC layer network for using BPL
 - No engineering or science seems to be used
 - No technical discussion
 - Maybe later, PSCC will pick up the issues that P1901 cannot address
 - b. IEEE/USA
 - DySPAN is developing a more efficient method for using spectrum
 - Some spectrum needs to be quiet: is that a need that will be addressed.
- 5. PSCC Long Range Planning
 - a. **Action Item:** Frances will contact the TCAB to try to identify joint efforts with other Committees that may like to have communication expertise in particular WGs. She will also contact Alex Apostolov of the PSRC to review possible joint WGs in the H subcommittee.
 - b. Use of BPL by CenterPoint will be part of the BPL Combo panel session – make sure a room is provided for this.
 - c. John/Terry will put together a panel session focused on BPL
 - d. Email any reactions/issues