

**POWER SYSTEM RELAYING
COMMITTEE**

OF THE

IEEE POWER ENGINEERING SOCIETY

MINUTES OF THE MEETING

January 12-15, 2004

Tampa, FL

**Power System Relaying Committee
Main Committee Meeting Agenda
January 15, 2004**

Tampa, FL

- | | | |
|--------------|--|-------------------------|
| I. | Call to order / introductions | Taylor |
| II. | Approval of Minutes/ Financial Report | Henville |
| III. | Reports of Interest | |
| | A. Chairman's Report | Taylor |
| | B. Technical Paper Coordinators Report | Winston |
| | C. PES Report | McDonald |
| | D. Cigre Report | Cease |
| | E. EPRI Report | Burger |
| | F. IEC Report | Udren |
| | G. Standard Coordinators Report | Sachdev |
| | H. Substation Committee Report | Cooley |
| IV. | Subcommittee Reports- in order | |
| | B- Advisory Committee | |
| | C - Systems Protection | Novosel |
| | D - Line Protection | Carpenter |
| | H - Relaying Communications | Fodero |
| | I - Relaying Practices | Ingleson |
| | J - Rotating Machinery | Conrad |
| | K - Substation Protection | Sufana |
| V. | Old Business | Taylor |
| VI. | New Business | Taylor |
| VII | General Announcements | Taylor |
| VIII. | Presentations | |
| | • Summary of C37.92 Trial Use Standard for Low Energy Inputs to Protective Relays | Udren |
| | • Early Experiences with Optical Transducers in Protection | Klimek, Henville |
| IX | Adjourn | |

Call to order / introductions

Taylor

Rick Taylor called the meeting of the IEEE/ PSRC Main Committee in Tampa, FL to order at 8:05 AM on January 15th, 2004.

Approval of Minutes – Scottsdale meeting and misc. Henville

The minutes of the Madison meeting September 22-25, 2003 were approved.

A summary of the PSRC finances was presented as follows.

TOTAL ASSETS	\$20,606.74
LIABILITIES	\$ 0

Income and Expenses by Major Category (\$1000's)

Income	
Miscellaneous	\$8.6
Registration	\$50
Sponsorship	\$0
Total Income	\$58.6
Expenses	
Miscellaneous	\$8.5
Meeting expenses	\$43.1
Total Expenses	\$51.6
INC-EXP.	\$7.0

Miscellaneous income and expenses consist mainly of the UCA meeting expenses and reimbursements. The UCA hotel meeting expenses are processed through the PSRC but are reimbursed by UCA meeting organizers.

It was noted that since assets were more than one full meeting expenses, and also since income was considerably more than expenses during 2003, the meeting registration fees would be reduced in 2004.

It was also noted that although there were no sponsorships during 2003, support of PSRC by sponsors is much appreciated in furthering the business of the Committee. For the January 2004 meeting, the financial support of coffee breaks by Tampa Electric Company and Beckwith Electric Company was gratefully acknowledged.

Chairman's Report

Taylor

The PSRC is pleased to recognize our members of the IEEE Fellows class of 2004. Our secretary, Charlie Henville, was recognized for contributions to power system protective relaying. Miroslav Begovic was recognized for leadership in developing analysis tools and protection techniques for electric power transmission systems and renewable generation. Tarlochan Sidhu received his recognition for innovations and contributions to the development of digital relaying algorithms.

Our attendance for this January, 2004 meeting exceeded 200 for the second time ever. It is gratifying to see this level of interest, which, I believe, is a direct result of our efforts to increase our interaction with, and visibility to, the protective relaying community. The response to the

August 14 blackout, as led by Damir Novosel, again demonstrated our relevancy to real-world problems and solutions.

Efforts to significantly increase the distribution of our working group outputs have had a degree of success by use of our web site and by utilization of the regional relaying conferences. However, IEEE Guides, which may be our most valuable outputs, are not widely distributed due to the IEEE pricing and marketing policies. After a couple of years of lobbying the IEEE publications group for more reasonable prices and more aggressive marketing, PSRC has made no progress. IEEE will be given one more opportunity to respond positively to our requests. If this does not occur, PSRC will begin withdrawing these guides from IEEE. The information in these guides will be updated and revised and then packaged as a "PSRC Application Report". These reports will be made available on the PSRC web site. [Note: As of mid-February, the IEEE has indicated they will make a proposal to meet the PSRC requests. This proposal is to be submitted by the end of February.]

Technical Paper Coordinators Report

Winston

The planning meeting to coordinate the technical sessions for the PES 2004 General Meeting will be held in late January in Chicago, IL. There were sixteen papers submitted for consideration and/or review by the PSRC for this meeting. Twelve papers were accepted, two were rejected, and two were reassigned. Assuming that technical sessions are held at the General Meeting, at present it appears that the PSRC will sponsor one paper session. The remaining papers will be presented at the poster session or possibly at a jointly sponsored technical session.

PES Report

John McDonald

No report at this meeting

CIGRE Report

Cease

The 2003 Colloquium was held in Sydney, Australia September 28 to October 3, 2003. The preferential subjects for the 2003 Colloquium were:

1. Automation of New and Existing Substations
Special Reporter: Walter Baass (Switzerland)
The US has 1 out of 16 paper in this session
2. Fault and Disturbance Data Analysis
Special Reporter: Mladen Kezunovic (USA)
The US has 5 out 21 papers in this session
3. Modern Distance Protection Functions and Applications
Special Reporter: Demetrious Tziouvaras (USA)
The Us has 2 out of 12 papers in this session

The 2004 General Session will be held in Paris as normal. The US has submitted 4 papers for consideration for the conference. In the past we have been able to have 2 papers included in the conference. The preferential subjects are as follows.

PS1

Use and Benefits of Information Technology (IT) in Substation Automation, Protection and Local Control

- Use and Benefits in monitoring, operational planning, maintenance planning, asset management
- Quality of information: security, accuracy/validity, contemporariness, speed of acquisition

- Use and experiences of internet/intranet and WEB applications in Protection and Substation Automation
- Standardization issues for Substation Automation, Protection and Control: present situation and experiences, expectations and limits, IEC 61850 perspectives

PS2

The needs for software aids/tools in Protection Management and Engineering: application, databases, and testing/certification.

- Single entry databases for multi-user access, user interfaces, links with other bases
- Tools for protection settings and interaction with power system tools
- Tools for applying settings and for conjunctive operation of test equipment
- Documentation tools for life time management of protection equipment

The 2005 Colloquium will be held in Calgary, Canada. More details will be provided later.

There was a joint CIGRE/IEEE-PES International Symposium titled "Quality and Security of Electric Power Delivery Systems" held in Montreal, Canada October 7-10, 2003. One of the topics is "Impact Of Protective Device Practices On System Quality, Reliability And Security.

At the colloquium a new working group was formed new WG B5.16 on "Modern techniques for Protecting Busbars in HV networks". I am looking for someone to be a member of this working group (either regular or corresponding). Also there is a need for a member for CIGRE WG34.10 Protection of Series compensated lines & series capacitor banks. Anyone interested please contact me. The US member of WG B5-18: "Guidelines for specification and evaluation of substation automation systems" has indicated his desire to become a corresponding member. Any one interested in becoming a regular member of WG B5-18 please contact me.

EPRI Report

No report at this meeting

Burger

IEC Report

See WG I4 Report

Udren

Standard Coordinators Report

The Standards Coordinator, Mohindar Sachdev, met with the Chairs of the Working Groups writing and revising standards documents at 8:00 AM / 9:45 AM on January 13, 2004 in Washington Room, The Wyndham Westshore Hotel, Tampa, FL.

Sachdev

The status of PARs, Standards and Guides, were reviewed at the meeting. The status of the PARs is summarized in this report. The actions to be taken for keeping up-to-date the approval of the PARs and for keeping live the Standards and Guides are identified. A summary of the specific approvals received, since the September 2003 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/
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.html
Style manual	http://www.standards.ieee.org/resources/glance_at_writing_new.html
Template	http://www.standards.ieee.org/resources/glance_at_writing_new.html
Pre-balloting editorial review	http://standards.ieee.org/resources/development/
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	http://standards.ieee.org/resources/development/
Submit request for initiating balloting	http://standards.ieee.org/resources/development/
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://www.standards.ieee.org/sa/sa-view.html
SA Bylaws	http://www.standards.ieee.org/sa/sa-view.html
SB Operations Manual	http://www.standards.ieee.org/board/
SB Bylaws	http://www.standards.ieee.org/board/

Standards Coordination Effort

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

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

The copy of the PAR can be viewed by clicking at the number of the PAR in the list. All members of the PSRC are requested to review the newly approved PARs. If you are interested in the development work planned in a PAR, contact the Chair of the Working Group that is developing the document and sign up for participating in the activity of that Working Group.

STANDARDS ACTIVITIES SINCE THE SEPTEMBER 2003 MEETING OF THE PSRC

The status of the standards approval activities, which have taken place since the September 2003 meeting of the PSRC, is as follows.

1. Standards waiting to be Published

- PC37.103 Guide for Differential and Polarizing Circuit Testing
- PC37.106 Guide for Abnormal Frequency Protection for Power Generating Plants

PC37.115 Standard for Test Method for Use in the Evaluation of Message Communications Between Intelligent Electronic Devices in an Integrated Substation Protection, Control and Data Acquisition System

2. Standards approved

PC37.115 Standard for Test Method for Use in the Evaluation of Message Communications Between Intelligent Electronic Devices in an Integrated Substation Protection, Control and Data Acquisition System

3. Standards NOT approved

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

4. Standards submitted for approval

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

5. Standards re-circulated

None

6. Standards being re-circulated

PC37.93 Guide for Power System Protective Relay Applications of Audio Tones over Telephone Channels

7. Standards to be re-circulated

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

C37.92 Standard for Low Energy Analog Signal Inputs to Protective Relays

8. Standards submitted for balloting

PC37.90.2 Standard for Withstand Capability of Relay Systems to Radiated Electromagnetic Interference

9. Standards being balloted

None

The PARs approved since September 2003, submitted, and the PARs for which extension has been applied are as follows. The PARs, which will expire in the near future, are also listed. Applications for extending the lives of these PARs should be filed soon.

10. New PARs applied for

PC37.91 Guide for Protecting Power Transformers

11. New PAR approved

PC37.91 Guide for Protecting Power Transformers

12. PAR Extensions applied for

PC37.92 Standard for Low Energy Analog Signal Inputs to Protective Relays

13. PAR Extensions approved

PC37.92 Standard for Low Energy Analog Signal Inputs to Protective Relays

14. PARs expiring at the end of 2004

- PC37.90.2 Standard for Withstand Capability of Relay Systems to Radiated Electromagnetic Interference
- PC37.92 Standard for Low Energy Analog Signal Inputs to Protective Relays
- PC37.93 Guide for Power System Protective Relay Applications of Audio Tones over Telephone Channels
- PC37.97 Guide for Protective Relay Applications to Power System Buses
- PC37.98 Standard Seismic Testing of Relays
- PC37.101 Guide for Generator Ground Protection
- PC37.102 Guide for AC Generator Protection
- PC37.110 Guide for the Application of Current Transformers used for Protective Relaying Purpose
- PC37.117 Guide for the Application of Protective Relays Used for Abnormal Frequency Load Shedding
- PC37.118 Standard for Synchrophasors for Power Systems
- PC57.13.1 Guide for Field Testing of Relaying Current Transformers
- PC57.13.3 Guide for Grounding of Instrument Transformer Secondary Circuits and Cases

SUBMITTAL DEADLINES & STANDARDS BOARD MEETING SCHEDULE

PAR/Std Submittal Deadline	Standards Board Meeting
February 13, 2004	March 25, 2004
May 14, 2004	June 25, 2004
August 13, 2004	September 23, 2004
October 19, 2004	December 8, 2004

Substation Committee Report

Cooley

The Substations Committee, Subcommittee (C0), responsible for Data Acquisition, Processing and Control Systems met this week on Monday and Tuesday. Work by all three of the subcommittee Working Groups, C1, C2 & C3 and their active Task Forces, C2TF4 and C3TF1 was conducted. Members and guests averaged a combined total of 15 for each session.

Work is nearing completion on P-1646, the standard for message delivery times for integrated substation control, under Working Group C2 Task Force 4. The document has been successfully balloted and is ready for submission to IEEE - SA.

Working Group C3 used double sessions to work on C37.1, the "Scada Standard". The document is being heavily revised to be more in tune with distributed substation control architecture using IEDs.

Working Group C2, Applications of New Technologies in Substation Monitoring and Control has completed a tutorial on Automation Systems. It was presented for the first time at the Dallas T&D Meeting in 2003. Over 60 people were in attendance for some or all of the session and it was well received. This tutorial is still being refined and will be presented again in Denver and possibly the New York Expo in October of this year.

Working Group C1 is discussing the problem of documenting dynamically the status of functions that are assigned to IEDs. Historically, this documentation for substation functions has been maintained on static drawings such as relay one lines. C1 is also discussing a guide for preparing purchase specifications of software and hardware for use in substations. C3TF1 met in double sessions for work on P1615 focused on substation network communications.

On behalf of the C0 Chairman, Jim Evans and the attending members of the Substations Committee I would like to acknowledge the PSRC members who have taken the time to attend our meetings and we appreciate the opportunity to attend yours.

OLD BUSINESS

None

NEW BUSINESS

Al Darlington was presented by Jim Huddleston III with a photograph album. Jim had prepared this album that featured photographs of Al at many of the previous meetings that he had attended.

FUTURE MEETINGS

May 17-20, 2004	St. Louis	Hyatt Regency
September 13-16, 2004	Portland, OR	Doubletree Lloyd Centre
January 10-13, 2005	San Diego, CA	San Diego Marriot Del Mar
May 23-25, 2005	Columbus, OH	Drury Hotels/Convention Center
September 8-16, 2005	Calgary, AB	The Westin Calgary (Joint with CIGRE SC B5)
January 9-12, 2006	New Orleans, LA	Hotel Monteleone

B: ADVISORY COMMITTEE

Chair: R.P. Taylor

Vice Chair: P. B. Winston

B1: Awards and Technical Paper Recognition

Chair: R. Hedding

Vice Chair: F. Plumtre

Roger Hedding accepted the position as chair of this working group for 2004. Frank Plumtre accepted the position as vice chair.

Awards given out at Thursdays main committee meeting:

- Subcommittee chair recognition awards: Simon Chano - Substation Protection
Ron Westfall - Line Protection
- Technical Committee Working Group Award for Standard or Guide: Standard ElectroStatic Discharge Testing for Protective Relays
- Technical Committee Working Group Prize Paper Award : "Application of Peer to Peer Communication for Protective Relaying "
- PSRC Distinguished Service Award for 2003 : Albert N. Darlington
- Iron Man Award for attending 24/24 PSRC Committee meetings from 1995 thru 2003: Al Darlington, George Nail
- Perseverance Award for coming to meetings when employer stopped supporting : Kevin Stephan

The nomination process for the Baker, Fink, and Thompson awards was discussed. A short list of papers is due to the working group chair by January 23rd.

B2: Fellows Awards

Chair: J.S. Thorp

Three PSRC members were made Fellows in the last election cycle. They were:

Miroslav Miodrag Begovic

for leadership in developing analysis tools and protection techniques for electric power transmission systems and renewable generation.

Charles F. Henville

for contributions to power system protective relaying.

Tarlochan Singh Sidhu

for innovations and contributions to the development of digital relaying algorithms

The committee also discussed the fact that the PSRC does not have a representative on the PES Fellows Committee for the coming year.

B3: Membership Committee

Chair: M.J. Swanson

Attendance during the PSRC meeting in Tampa was an all time record of 211 (previous maximum was 205 at the January 2000 meeting in San Diego).

11 new attendees were in our Newcomers Orientation meeting on Tuesday.

Activities in support of planned strategies:

Continuing to recruit new attendees using existing methods.

New User attendees at the September 2002 meeting: No attendees attended 4 meetings, (1) attendee attended 3 meetings, (4) attended 2 meetings, and (3) attended only their first meeting. (There is an error in the input data here).

New User attendees at the January 2003 meeting: (3) attended three meetings; (4) attended 2 meetings, and (18) attended only their first meeting.

New User attendees at the May 2003 meeting: (12) attended two meetings; and (14) attended only their first meeting.

The following new attendees since 2000 have attended a high percentage of subsequent meetings: Oscar Bolado, Gustavo Brunello, Christoph Brunner, Art Buanno, Bill Dickerson, Ashok Gopalakrishnan, Randy Horton, Bill Kennedy, Gary Kobet, Ashish Kulshrestha, Steve Kunsman, O. Nayak, and Jon Sykes. These people show a strong commitment, and if not already doing so, should be encouraged to accept interesting projects.

I have not yet started sending emails to North American protection supervisors promoting attendance.

The PSRC staff is promoting further attendance at the Newcomers meeting that have a rotating equipment background.

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

Chair: J.C. Appleyard

No activity to report

B5: Bibliography and Publicity

Chair: T.S. Sidhu

Vice Chair: M. Nagpal

The WG met on Jan. 13, 2004 with five members and three guests in attendance. Minutes from the Sept. 2003 meeting in Madison were approved. Assignments for preparation of the 2003 bibliography paper were made. Publicity report will be prepared by Mal Swanson based on a form to be supplied by Phil Winston. Al Darlington will review the 2002 NERC report. It was also indicated by Phil Winston that Aug. 14 blackout incident will not be a part of this report. After some discussion, it was decided that bibliography papers will continue to be published in the IEEE Transactions on Power Delivery. T.W. Cease (Editor-in-Chief of the IEEE Trans. on Power Delivery) was also present during these discussions.

B8: Long Range Planning

Chair: George Nail

No activity to report

B9: PSRC Web Site

Chair: Bill Lowe

Accomplishments:

- Modified the main page with a button to download the 2004 PSRC Directory.
- Changed file naming format to reduce the chance of users trying to download old versions of files.
- Began looking into obtaining web statistics, number of downloads, etc. The statistics are available in raw form, but a tool has to be located that can make sense of this information.

- Completed all updates relating to the January meeting.

Action items:

- Develop web pages to display digital photos relating to recent meetings.
- Develop a web page honoring PSRC main committee members who are IEEE Fellows.
- Determine how web statistics can be converted to useful data.
- Research a way to have a question and answer forum.
- Update all necessary web pages relating to the May 2004 meeting.
- Update pes-psrc mailing list subscriber data and web email addresses.

C: SYSTEM PROTECTION SUBCOMMITTEE

Chair: D. Novosel

Vice Chair: T. Seegers

The system protection Subcommittee met on January 14, 2004, with 53 people attending including 20 members.

Chairman Novosel discussed interest in forming a panel of relay experts to serve on IEEE panel on blackout issues. Our subcommittee was asked to form the panel. The meeting is in New York in October. The panel is needed by April 12.

Working Group Reports:

C2: Power Quality Issues in Protective Relaying

Chair: T.W. Cease

Vice Chair: S. Kunsman

C2 met Tuesday January 13, 2004 in Tampa, FL with 8 members and 8 guest present. The total number of members increased by one to 27.

C2 did not meet in September 2004.

TW reviewed the open action items from last meeting. Actions complete from last meeting:

- Assignments Reviews assignments due July 31, 2003
Section 3.4 and 3.5 – Inmaculada Zamora – complete
- Additional writing assignments due July 31, 2003
Section 3.6.4 and 3.6.5 How Application on the IEC and EN standards affects the protective relaying - Inmaculada Zamora - complete

A few writing assignments are missing to bring the document to a final draft. The summary section will be prepared when the assignments are complete. TW to track down Eric Udren and Roger Hedding on their open action below.

All members have been asked to review the document. It appears that not all 26 members were included in the distribution and this will be resolved. The latest version of the document will be posted on the IEEE PSRC C Subcommittee website under WG C2. The link to the PSRC site will be provided in the distribution of the minutes along with the document.

Eric Gunther will identify other IEEE PQ documents that can be used for inclusion or reference in the C2 document.

Eric Gunther proposed that the C2 document be provided to the IEEE Standard Coordinating Committee 22 which is the PQ coordinating body for all of the IEEE. They can review and provide comments to the C2 working group.

Action Items:

1. Section review assignments due February 29, 2004
Section 6 – Roger Hedding
All sections – all members
2. Additional writing assignments due February 29, 2004
Section 3.6.3 Application of ITI Curve for Distribution Networks - Patrick Carroll
Section 3.6.1 Writing assignment on issues of PQ monitoring and relays - Steve Kunsman
Summary/Recommendation paragraph on next steps to the paper - Eric Udren
3. Eric Gunther to distribute a recently published paper on PQ in Word format. Sections maybe used for inclusion in the paper.
4. Incomplete writing assignments due no later than February 29, 2004
All authors to review section and to reduce figure size (eg jpg format) all
5. Update and provide comments on bibliography - Sidhu
6. TW to confirm the latest document is posted on the IEEE website.
7. TW to send out a ballot document requesting PSRC members for comments and approval.

C3: Trends and Issues with Relay Settings

Chair: Steve Kunsman

Vice Chair: Gary Kobet

Working Group C3 met Tuesday, January 13, 2004 in Tampa, FL in a double session with 12 (of 18) members and 26 guests participating. Three of these guests requested to become new members increasing the total membership to 21.

The first session was dedicated to utility presentations on the relay setting process.

- Randy Horton (presenter) & Rick Cornelison – Alabama Power Company
- Jim O'Brien – Duke Energy
- Russ Patterson - TVA

Some of the main issues and concerns raised during the open discussion were:

- Duplicate Settings database and how to assure control
- Revision control of paper/e-copy of settings
- Most utilities are migrating to electronic masters but Canadian regulators require a approved hard copy of the setting/designs.
- In a device failure situation, how to assure the database settings are compatible with the firmware of the replacement device.
- Some tools do not support an audit/history trail of changes.
- Security and access outside the protection department.

The 2nd session was kicked off with a review of the C3 objectives and work statement. A discrepancy on the working group title was discussed (Protection Systems vs Relay Settings). It was decided that the scope shall be limited to Relay Settings Process.

Reviewed the initial outline.

- Similarities between Relay Vendor product development processes and the utility relay setting processes were discussed. From the creation, implementation and execution these process have synergies. Relay vendors typically have a Quality System that defines the process and can be certified to ISO-9001. This discussion resulted in the addition of a new outline section Quality control and quality management system.
- Relay settings are typically “set and forget” and will be in place until a misoperation occurs. The group discussed the need for peer reviews of the initial settings to be included in the relay setting process as well as a periodic review of settings installed base.

Relay calculation development is performed with a certain set of contingencies (typically n-1). With the events like the NE blackout, it was raised is the n-1 rule of thumb sufficient. This should be taken into consideration section on Relay Setting Process.

C4: Wide Area Protection and Emergency Control

Chair: M. Begovic

Vice Chair: D. Novosel

The working group did not meet in January.

Papers are complete. After some final editing the paper will be circulated to the wg. Once the papers are circulated and approved by the officers, they will be submitted to transactions. This will complete the assignment of this working group.

C5: Deployment and Use of Disturbance Recorders

Chair: B. Jackson

Vice Chair: W.M. Strang

Working group meeting was held on Tuesday Jan. 13 from 4:30-5:45 pm with 10 members and 16 guests.

The chairman reviewed the purpose of the paper and status of the draft document. The draft is listed in HTLM format on the PSRC, C-5 working group site.

Four writing assignments were received and reviewed during the meeting. A number of other assignments are still outstanding and the chairman has contacted those members. New assignments were made and group was asked to review the whole document as several section overlap.

About 80% of the outline has been completed or assigned. The chairman will work with members to complete the remaining sections.

Jim Ingleson provided a brief review of the NE blackout and disturbance monitoring. Data on bus frequency and voltage was very good. Time tagging of breaker trips was not very good.

C6: Relay Engineering in Power Engineering Curricula

Chair: S.S. Venkata

Vice Chair: J. DeLaRee

Working group C-6 Met with 25 members and guest. The meeting was conducted by the vice-chair. Copies of the minutes of our last meeting were distributed. The topic of discussion of the meeting included:

Scope of the Working Group
Basic Instructional Modules related to Power Systems Protection

Introduction to Power Systems
Basics of Protection
System Components

Analysis tools
Power System Studies
Symmetrical Components
Short Circuit Calculations

Relay Basics – Electromechanical/Electronic/ μ -processor-Based
Setting Criteria
Instrument Transformers

Signal Conditioning
Sampling Rates
Filtering

Circuit Breakers
Fuses

Coordination

The chair and Vice-Chair will generate a root document to include all these topics. The document will be circulated among all members and interested guest. The intention of the WG is to generate a set of self-contained, stand-alone modules useful to teach new engineers as well as university students the principles of protection.

C7: Power System Protection Testing

Chair: V. Madani

Vice Chair: H. DoCarmo

WG C-7 Met on January 13 in two sessions with total 42 in attendance including 14 Members and 20 Guests. 8 new people are interested in becoming members.

a) Two presentations:

- 1) Test philosophy, experiences and trends presented by Marc Achterkamp – KEMA T&D Consulting.
Discussion centered on Certification Tests, Conformance, Normalized or Normalization of test data, Application, and Functional tests, etc.
- 2) The Western Area Power Experiences with End-to-End testing - Mike Agudo

Discussions on State Simulation Tests, advantages and limitation pertaining to the impact of load flow, periodic tests

b) Review of Assignments

The WG members also reviewed the contributions and exchanged ideas.

c) Discussions on the Title of the WG

For clarification purposes, the participants discussed the Title of the WG and the scope outlined by the C Subcommittee and suggested a revised Title, and agreed with the development of a guide for system testing. The title will be revised from Multi-Station and System Testing, to Power System Protection Testing. Below is a summary discussion

Scope:

The Working Group will develop a guide for Power System Protection Testing. The Guide will include System Application Test Requirements, Scope and level of tests and Benefits of system testing for Overall Protective Schemes. This assignment encompasses overall system testing procedures (generators, line, transformer, capacitors, SPSs, end-to-end testing, distributed application within substation, etc.), data collection requirements, as well as the test procedure definitions. The WG will describe the methods, extent, and types of system tests for protection at various voltage levels and applications.

Working Group Member Discussions and Agreements:

The WG members have discussed the format and the final product in previous meetings. The alternatives discussed included:

1. Types of tests recommended for overall equipment protection and the overall benefits for each test
2. Type of document to be generated by the C-7 WG. Should we generate a Report, a Recommended Practice, or a Guide? Consideration for the product generated by the future WGs that will be formed as a result of the C-7 WG efforts. The WG recognized that the scope for recommended practice needs to be narrow to be applied as a guide.

After discussions in different sessions, the WG members agreed that the C-7 WG will aim at preparing a Guide for the overall benefits and types of tests recommended for the overall system tests. A transaction paper may later be prepared as a result of the C-7 efforts.

C8: Phasor-Based Models for Analyzing Relay Performance

Chair: M. Meisinger

Vice Chair: M. S. Sachdev

The Working Group met at 09:30 AM on January 14, 2004 in Grand Ballroom East, Wyndham Westshore Hotel in Tampa, FL. Six members and six guests were present.

The Chairman reported that Draft 9 of the WG paper was balloted in the Working Group. Seventeen (out of a total of 22) voted for approval and approval with comments. No negative ballots were received.

The chairman further reported that the suggested changes, which are editorial in nature, will be incorporated in the draft and it will be submitted to the Subcommittee members for comments of substance. If no comments of substance are received within four weeks of the submission of the

paper, it will be submitted to the officers of the PSRC for approval and permission to publish in the IEEE Transactions on Power Delivery.

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

C9: Underfrequency Load Shedding and Restoration

Chair: A. Apostolov

Vice Chair: K. Behrendt

The working group met on Wednesday, January 14th, with 21 members and 10 guests present. Draft 3 of the document had been circulated, with an informal working group survey to soliciting comments. Only 6 ballots have been returned, so the deadline for returning ballots was extended to Monday, January 19th. Comments from the ballots will be summarized and turned over to a review committee consisting of Rich Hunt, Ron Beazer, Ken Birt, and Rich Young. The review committee will perform an editorial review, harmonize the document style and content, eliminate repetition, and incorporate additional figures, as necessary.

The review committee should provide a finished document by March 15th, at which time the document will be sent to the working group with a second informal ballot. Any negative working group ballots and significant comments will be resolved during the May, 2004, meeting.

The final document will be completed by July 15th, at which time we will start the official balloting process to gain approval for the guide.

The working group discussed underfrequency load shedding issues that may have been raised by the August 14th, 2003, Northeast blackout. General consensus was that the UF schemes worked as expected, but the network collapse was beyond anything that could have been prevented by UF load shedding. There was some discussion about the use of undervoltage supervision, and how this should be set.

C10: Effects on Changing Utility Environment on Protective Relaying

Chair: J. DeLa Re

Vice Chair: R. Hunt

Working group C-10 met, Tuesday, January 13, 2003 with 17 attendees. The chairman distributed minutes of the Madison meeting. Version 4 of the WG Report was distributed to all members and interested guest. The following schedule shows the intended dates and final revisions to our document. The Report is expected to be finished and delivered to the Sub-Committee during our next and final meeting in May.

Schedule:

WG members respond by Feb 6th

Resolve all negative issues by Feb 20th

Send to C subcommittee members on Feb 20th

C subcommittee members respond by March 19th

Resolve all negative issues and publish by April 2nd.

C11: Protection Issues During System Restoration

Chair: T. Sidhu

Vice Chair: D. Tziouvaras

The working group met on January 13, 2004 with 5 members and six guests in attendance. The paper was balloted prior to the meeting. Sixteen ballots were returned (out of 18); 9 members approved without comments and 7 members approved with comments. Most of the comments were of editorial nature and were resolved during this meeting. The paper is now ready for review by the subcommittee members.

Liaison Reports:

1. IEEE PES Power System Stability Controls SC

Gary Michel

The IEEE/PES Power System Stability Controls Subcommittee and the Power System Dynamics Measurements Working Group have not met since the last report.

Related Activities:

A Wide Area Measurement System (WAMS) is being developed in the Eastern USA. The Eastern Interconnection Phasor Project is being coordinated and facilitated by the U.S. Department of Energy (DOE) through the Consortium for Electric Reliability Technology Solutions (CERTS). Reliability councils and standards organizations are enabling this work. System operators, transmission owners and manufacturers are implementing the system.

The Eastern Interconnection Phasor plan embodies a vision for the overall project in two stages. In the near term, the project team seeks to use expertise and equipment developed under auspices of the U.S. Department of Energy to deliver value to project participants in the Eastern Interconnection. Most of this existing expertise involves off-line analysis and is supportive of planning activities. In the long term, the vision calls for delivering value within the operations environment using new inter-regional information and measurement systems.

2. NERC EC

Winston

No activities to report

3. PES Power Systems Analysis, Computing, & Economics

Mal Swanson

No activities to report

New Business

No new business was discussed

CTF1 Cybersecurity Issues for Relaying

Task Force Chair: S. Ward

The CTF1 task force met with 29 people, of which 12 (plus 2 after the meeting) indicated that they would become members. A task force was suggested at the September meeting based on a recent Cyber Security standard issued by NERC. The "Cyber Security Standard" and another relevant document; "Securing Remote Access to Electronic Control and Protection Systems", were presented during the meeting (these documents can be found on <http://www.nerc.com/~filez/standards-cyber.html> and <http://www.nerc.com/~filez/cipfiles.html>).

The present NERC Cyber Security Standard specifically excludes relaying and the group recommended that a working group in PSRC should be formed. The C subcommittee approved the recommendation and the new WG 'C1 Cyber Security Issues for Relaying' will start regular sessions at the May meeting.

The group will meet at the May 2004 meeting, single session. A room for 30 people with a computer projector is requested,

Assignment

- To prepare a report documenting the status of cyber security standards, recommended procedures and guidelines for cyber security for protective relays
- To provide a liaison to other agencies preparing cyber standards in fields related to relaying
- To provide timely review from a relaying perspective of draft documents prepared by other agencies

Expected Completion Date

One year was suggested (May 2005) but perhaps this is not realistic. To be further discussed at next meeting.

Working group C1 Cybersecurity Issues for Relaying has been appointed to complete this assignment. Chair will be Solveig Ward. Vice-chair will be Jim O'Brien.

CTF4 Special Protection Schemes

Task Force Chair: M. Begovic

The TF met in a single session with 22 guests in attendance. It was moderated by Miroslav Begovic. The meeting started with the brief presentation on the earlier (1993) effort on the same topic, conducted under the auspices of IEEE PES and CIGRE under the leadership of P. Anderson and B. LeReverend. The IEEE Transactions paper, which was the end product of their survey, was published in 1996 and served as a source of information for the presentation.

The discussion that followed was centered on the assignment, deliverables, timeline and leadership of the Working Group under consideration. The overwhelming majority of the attendees were in favor of forming the new Working Group, with 12 attendees expressing interest in being the founding members. Some discussion ensued on what should be the scope of the new WG (special protection schemes, system protection schemes and remedial action schemes were discussed in that context). Also, various aspects of the possible focal issues were discussed (RAS design, operational experience, reliability, redundancy). It was decided that a possibility of another joint effort with CIGRE, and possibly other Committees within the IEEE PES. The new survey should be created on the internet, which should greatly facilitate the response. Jaime deLaRee will investigate the availability of the survey processing software which was once used within the PSRC for similar purposes. The meeting adjourned at 9:15.

Proposed Assignment:

It is proposed to conduct a comprehensive survey of the utilities world-wide with the objective of accumulating updated industry experience with the remedial actions protection and emergency control schemes, from a variety of perspectives including, but not limited to design, operational experience, reliability, etc. The work should be conducted in the realm of an internet-based

questionnaire. The responses should be sought through all media of communication available and with the assistance of all other interested partners (IEEE PES, CIGRE, etc.)

Deliverable:

The results should be compiled in the form of the report to the Main Committee of PSRC, as well as the Transaction paper.

Timeline:

Expected completion date should be no later than May 2006 (3 years).

Leadership:

It would be desirable to have someone with utility affiliation in the leadership position for the new Working Group. Corporate memory and experience could be provided by some of the former members of the WG on wide area protection and emergency control (C6), who could assume the position of the Vice-Chair.

The subcommittee accepted the proposed assignment. A new working group C4 will be formed with the following title: **Industry Experience with Remedial Action Schemes**

D: LINE PROTECTION SUBCOMMITTEE

Chair: M. Carpenter

Vice Chair: Roger Hedding

D2: Fault Locating PC 37.114/D7 Guide for Determining the Fault Location on Transmission And Distribution Lines

Chair: Karl Zimmerman

Vice Chair: Damir Novosel

Working group D-2 met with 3 members and 7 guests.

PC37.114D8 has been balloted and approved with all negative ballots resolved. The guide was submitted in November to the IEEE Standards Review Committee by REVCOM. PC37.114D8 was not approved due to some editorial issues with coordination groups, equation formatting, and metric conformance, and figures required as separate files.

The working group chair is working with a technical document specialist, and a Revcom mentor (Mark Bowman). We should recirculate a ballot within a month. A PAR extension was applied for on 01/09/2004. The working group will do a presentation of the guide at the next meeting.

No meeting in St. Louis

D3: Impact of Distributed Resources on Distribution Relay Protection

Chair: Tony Seegers

Vice Chair: Ken Birt

Working group D3 met on Tuesday, January 13, 2004. 11 members and 19 guests attended the meeting.

Draft 4.0 of the paper was reviewed.

Members were asked to review the paper and send comments to the chairman, Tony Seggers, by the end of February. A copy will be sent to "D" subcommittee for review.

The paper will be published on the PSRC web site. We hope to have it finalized at the May meeting. It's planned to present the paper at regional conferences starting with the WPRC in fall of 2004. Rich Hunt will begin preparing a power point presentation for the conferences. We will line up people to make the presentations at the May meeting.

D5: Guide for Protective Relay Applications to Distribution Lines

Chair: W. P. Waudby

Vice Chair: R. Crellin

The working group met for a double session with 21 members and 11 guests.

The WG discussed clause 1 and various parts of clause 8. There are several outstanding writing assignments for clause 8. Topics of discussion included motor unbalance, breaker failure, single pole tripping, transformer inrush, and the implications of multiple faults.

Additional writing assignments to modify existing sections were made. All assignments are due Feb. 14th.

The document now includes figures re-drawn by Al Darlington. The document is on the web Page in .pdf format.

We request 2 sessions of 40 people for the May meeting.

D6: Out of Step Considerations on Transmission Lines

Chair: M. McDonald

Vice Chair: D. Tziouvaras

The WG met in a single session with 17 members and 15 guests attending. Meeting generally followed the agenda handed out by the chair Mike McDonald. Draft 2 of the document was handed out in the meeting.

An update on the current draft status was provided with the abstract redone and a Table of Contents and a section on definitions being added. The Chairman suggested our report be titled "Power Swing and Out-of-Step Considerations for Transmission Line Protection" to help clarify these are not the same phenomena – there were no objections.

There was considerable discussion in regard to the proposed definitions of 'power swing' and 'out-of-step' and as to whether while it is theoretically possible that the system can stabilize once a pole has slipped, whether it has ever happened. Members and discussers are encouraged to place their thoughts in writing and send to the chairman by Feb. 16th.

There was more discussion on the examples being included in the Appendix.

It was reiterated that the output of this WG is a report to the subcommittee and that if enough meaningful data is compiled that working to producing a Guide is possible once this report is completed.

More input is needed in Section 9 which addresses 'what we should be doing' in regard to protection. Topics such as what the advantages and disadvantages of given detection schemes, what kind of breaker ratings are needed, what should we do if unstable power swings are detected (block trip, trip, alarm). Alex Apostolov agreed to provide input.

Regrettably Mukesh cannot continue in his position as vice chairman. Demetrios Tziouvaras has volunteered to fill the slot.

D7: Loss of AC Voltage Considerations

Chair: E. Price

Vice Chair: R. Patterson

Working group D7, Loss of Voltage Considerations met on January 13, 2004 with 11 members and 9 guest (meeting 4 on attached roster). The third draft was reviewed and writing assignments were made [as assigned below], which are due March 12.

Discussions centered on:

- LOV effects on impedance units
- LOV effects on directional units
- System operation under LOV conditions

Assignments

New Assignments

Review the Section LOV Effects on Impedance and Distance Units	Arvind Chaudhary, Randy Horton
LOV effect on Directional Units	Charlie Fink and Elmo Price
LOV effect on load encroachment	Randy Horton
Identify, discuss and revise thoughts on Table 2 Generation LOV	Brad Nelson, Art Buanno
Identify and discuss LOV applications other than Transmission and generation LOV	Gary Kobet Mike Jensen

Old Assignments Not Addressed

Add discussion for risk analysis	Elmo Price
Improve Tables 1 & 2	Elmo Price
Review operational configurations that cause LOV to see if it needs to go elsewhere	Gary Kobet
Simplify specific vendor logic diagrams to basic generic concepts	Gary Kobet

D10: EMTP Reference Models for Transmission Line Relay Testing

Chair: K. Mustaphi

Vice Chair: T. Sidhu

The working group met on Wednesday, Jan. 14, 2004 with 6 members and 1 guest. Om Nayak made a presentation on PSCAD implementation of the model system. The report is ready for

balloting by the working group and subcommittee. There were discussions of presenting the work to PSRC main Committee and other relay conferences.

DTF1: Cold Load Pick Up Issues

The Task Force met on Tuesday, January 13, 2004 with 13 people present.

There was a discussion on the terms Cold Load Pickup and Inrush and how they are sometimes confused. Most of the discussion was on Cold Load Pickup, what its characteristics are, what conditions shape it and how it affects relay settings, both electromechanical/component solid state relays and microprocessor relays. Many microprocessor relays have specific settings to compensate for cold load pickup. It was agreed that some guidance in setting these relays would be helpful and that there has not been a lot published recently on the subject.

Several examples of circuit loads were shown that were de-energized and then re-energized. Some of these showed cold load pickup and others did not. There was also a discussion on how microprocessor relays or digital recoding meters may be used to gather useful data, though past experience has shown it would be difficult gather much data from within a working group.

It was decided that a literature search may provide some useful recent data.

It was decided by a consensus of the Task Force that a working group should be formed to explore what literature and studies may be available. Eleven of the thirteen people present indicated an interest in joining such a working group.

The assignment would be to prepare a special report to the PSRC that would describe the Cold Load Pickup and Inrush problems as they affect protective relaying; to gather a list of pertinent literature; to seek out recent studies that may provide useful data and present some real life anecdotal examples.

New Business

Fault Locating presentation at the May 2004 main committee meeting.

Need volunteers from affected utilities to participate in " Impact of voltage collapse on Line Protection" panel to be held at the Denver PES meeting.

Discussion on Zone 3 applications coming under fire. A task force was formed to investigate Zone 3 applications Considerations at next meeting. DTF2. Randy Horton will chair.

Tony Napikoski to chair D1, Cold Load Pickup issues...

High Impedance Fault Activity

None

H: RELAY COMMUNICATIONS SUBCOMMITTEE

Chair: K. J. Fodero

Vice Chair: A. P. Apostolov

H1: REVISION OF IEEE GUIDE FOR POWER LINE CARRIER APPLICATIONS JOINT WORKING GROUP

Chair: B. Nelson

Vice Chairman: M. Simon

Established: 1995

Output: Clauses 9 and 10 for the Revision of IEEE 643. 643 will be produced by the PSCC

Expected Completion Date: 1999

No meeting.

H2: PROTECTION USING SPREAD SPECTRUM COMMUNICATIONS

Chairman: Ken Behrendt

Vice Chair: Bill Lowe

Output:

Established: 2001

Expected Completion Date: 2003

The H2 working group met in a single session on Tuesday, January 13, 2004 with 9 members and 13 guests in attendance.

After introductions the agenda and draft 2 of the working group report were distributed. Thanks to Mark Simon and Ken Fodero for their recent writing contributions. There are still a few writing assignments pending.

The remaining unassigned outline items were discussed. The group agreed to delete several of the items from the outline. The remaining items were assigned as follows:

- 6.1.1 The table will be refined and simplified. – Veslin Skendzic
- 6.1.2 The section on communication topologies. – Ken Fodero
- 7.6 Interoperability – Mark Simon
- 7.7 Standards – Murty Yalla
- 7.8 Security – Dennis Holstein
- 8.4 Repeaters – Ken Fodero
- Interference techniques – Veselin Skendzic

A revised draft document will be posted on the H2 web site as contributions are received.

The next meeting will consist of a single session. A room for 40, with a projector screen and a power strip is needed.

H4: PC37.115, Standard test method for use in the evaluation of message communications between IEDs in an integrated substation protection, control and data acquisition systems.

Chair: D. Holstein

Vice Chair: Eric Udren

Established: 1997

Output: Standard

Expected Completion Date: 1999

No meeting.

H5: Common Data Format for IEDs

Chair: L. Smith

Vice Chair:

Output: Recommended Practice
Expected Completion Date: 2005

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

H5-A: Common Format for IED Configuration Data

Chair: D. Weinbach

Vice Chair: Dac-Phuoc Bui, Hydro Quebec TransEnergie

Output: Recommended Practice

Expected Completion Date: 2005

Met on Wednesday, January 14, 2004 at 8:00AM

34 in attendance. 10 Members and 24 guests

Summary:

The group was given a presentation on the IEC 61850 Substation Configuration Language by Alex Apostolov (presentation will be made available on web site). The presentation generated a lot of discussion about the scope and objective(s) of the group. We are beginning to converge on an understanding of the necessary work for the group, which will be to define the standardized method of capturing the configuration (settings) data for an IED in an XML file format. The method is to be compatible with IEC 61850, with one possible outcome being the eventual addition of the group's work into a future version of the IEC standard.

The group will now begin documenting the requirements and methods of storing IED configuration data in an IEC 61850 compliant manner. In order to limit the scope to a manageable size, the definition of a format for storage of device logic (as opposed to settings) will not be part of this group's work.

Presenter:

Alex Apostolov, AREVA T&D

Presentation: Concepts and Issues with 61850 SCL

Proposed Scope of group:

Define an XML IED Configuration File format using the IEC 61850 Substation Configuration Language

Limitations on scope:

1. Will not define a method for representing user-defined Logic in a standardized format/language. That task should go to a parallel or follow-on group.
2. Will extend but not change or conflict with IEC 61850 standard
3. Will not act as a standalone black-box description of the behavior of an IED. The I.L. and possibly other information on the device will still be necessary for understanding the behavior of the IED.
4. Issues:
5. What is the relationship of H5a to C3?

At next meeting:

1. Discuss and agree on scope
2. Begin documenting specific recommendations
3. Make writing assignments

Next meeting requirements: Room for 35, Computer Projector Required

H5-B: Common Format for IED Event Data

Chair: M. Adamiak

Vice Chair:

Output: Recommended Practice

Expected Completion Date: 2005

No Minutes available at this time.

H5-C: Common Format for IED Sampled Data

Chair: Benton Vandiver

Vice Chair:

Output: Recommended Practice

Expected Completion Date: 2005

The working group met on Wednesday, Jan. 14th, with 13 members and 15 guests present in concurrent sessions with H5-a and H5-b. The meeting minutes from Madison were reviewed and approved by the committee. Larry Smith, H5 chairman, reviewed the assignment of the H5-c committee to begin the discussions. The H5-c chairman presented an overview of the existing Comtrade sample data structure to establish present practice and usage. A review of the issues related to the Comtrade standard and what missing elements users are now looking for generated a discussion of committee expectations. A presentation overview of the newly released IEEE Std. 1159.3 (PQDIF) by Eric Gunther provided insight into the capabilities of the sampled data structure of PQDIF to support many of the new needs of sampled data structures now in IEDs.

An active discussion focused on the missing information and/or definitions needed to parse existing Comtrade sample data into the PQDIF format. A key will be the ability to move without data loss between the two formats, a paper will be prepared by Eric to investigate this and be presented at the next meeting. Christoph Brunner agreed to investigate the modeling structure of 61850 when applied to PQDIF. This would further generate benefits from merging these requirements too.

The working group consensus was that this would create a synergy of standards if all requirements could be met if Comtrade sampled data could be a subset of the PQDIF superset. It was agreed this would be the direction to investigate. The committee is still in a discovery mode but should begin a draft report after the May meeting.

The H5-c working group expects to meet again in concurrent sessions with H5-a and H5-b in a combined meeting requiring a room for 40 with PC projector and screen as part of a triple session.

H5-D: COMTRADE Issues

Chair: Ratan Das

Vice Chair: Amir Makki

Output: Recommended Practice

Expected Completion Date: 2005

No Minutes available at this time.

H6: APPLICATION OF SUBSTATION ETHERNET LAN COMMUNICATION FOR PROTECTION AND CONTROL

Chairman: John Burger

Vice Chairman: Charlie Sufana

Output: Special Report

Established: 1999

Expected Completion Date: 2003

The working group met January 13, 2004 with 11 members and 15 guests. The Chairman John Burger also invited everyone to attend the UCA Users Group Technical Subcommittee meeting that will follow the PSRC meeting.

Christph Brunner gave a short update on the status of IEC 61850. Parts 6, 8-1 and 9-2 are now Final Draft and are soon to be published standard. Part 10 is on the CDV stage.

The working group then proceeded to review Draft 4 of the paper. There was discussion on what words should be added to the dictionary, as well as the structure for that section. Several of the chapters are to have the figures cleared up to make them more readable. Additional sample cases were also requested.

It was also decided that the Reference section should include the Web address and the draft would be put on the PSRC web site by the end of February. Everyone in the WG will be asked to review and send comments to John Burger by the end of March.

For the next meeting the working group will meet in a single session for about 30 people need a PC projector.

H8: FILE NAME CONVENTION

Chair: A. Makki

Vice Chair: Ratan Das

Established: 2003

Expected Completion Date:

The group met with a total of ten (10) members and four (4) guests present. The previous subcommittee report and copies of draft 3.0 of the recommended practice were distributed.

Discussions:

The main objective for the group was to prepare for the PAR application. The discussions focused on the following issues:

Short names: The group agreed that users should strive to create short filenames but that there should be no derivatives of the format. Section 5.8 of the standard draft was modified accordingly.

Universal Format: The group agreed that the Universal Naming Convention is beyond the scope of this Working Group and should be addressed by another group. Section 7.0 was added to the Standard draft accordingly.

Compatibility: For compliance with the standard comma delimited format the group agreed that an additional comma is needed after the last field in order to separate from the extension field.

PAR Application: The group was audited by members of the communications subcommittee and was informed that the PAR application is past due. The Chairman sincerely apologized to the auditors for the delay and the apology was accepted. The Chairman then asked Bill Strang to lead the preparation of the PAR application and Bill accepted.

Subcommittee Report:

The Chairman respectfully requested permission from the PSRC Communications Subcommittee to file a PAR application for an IEEE recommended practice for naming Time Sequence Data files. The request was approved. The application will be submitted shortly and the group will be subsequently notified upon issuance of the Standard IEEE Number.

Conclusions:

The assignment statement was edited and now reads: "to write a recommended practice for naming time sequence data files such as transient records, event sequences and periodic logs."

The group will meet again during the next PSRC meeting. The Chairman submitted the edited assignment statement to the Relay Communications Subcommittee and requested a room for up to 25 people plus projector for the next meeting.

Finally, it is a pleasure to announce that Erich Gunther has volunteered to serve as the new group's Vice Chairman. We thank our previous Vice Chairman Ratan Das for his services. Ratan resigned due to obligations to other groups but is still a member of our group and we look forward to seeing him at the next meeting.

H9: Special Considerations in Applying PLC for Protective Relaying

Chair: M. Sanders

Vice Chairman: M. McDonald

Established: 1999

Output: Practical Paper for presentation at regional conferences

Did not meet at Tampa. The paper is final at Draft 17. The paper has been accepted for presentation at Texas A and M and Georgia Tech. We will submit to Western shortly. As already mentioned by our chair, it will also be presented at the May meeting in St Louis.

The paper will be posted on the web.

H10: REVISION OF THE AUDIO TONE APPLICATION GUIDE C37.93

Chairman: Bill Higinbotham

Vice Chairman: Jerry Hohn

Established: 1997

Output: Revised application guide

Expected Completion Date: 2000

This group did not meet in Tampa as the guide is out for re-circulation. As no negative ballots were received in the initial ballot, none are expected in the re-circulation. This group should not have to meet in St. Louis. If a meeting is required it will be scheduled at a later date.

H11: REVISION TO THE SYNCROPHASOR STANDARD

Chairman: K. Martin

Vice-Chairman: Dan Hamai

Established: 2000

Output: Revised Standard PC37.118

Expected Completion Date: 2003

Working Group H11 met at 8:00 am on Wednesday, January 14 in a single session. Ten members and five guests were present. The minutes from the September 24 meeting were read and approved. Draft 4.0 was distributed.

The WG was polled in December to approve the main body of Draft 3.20. The results were 16 “approve” and zero “disapprove.” Comments were consolidated and discussed at the WG meeting.

Discussion arose about “synchronized sampling” referred to in Section 1.1. M. Adamiak and K. Martin will review the Scope paragraph and make changes.

The WG group agreed that confusion arose when the term samples was used (i.e. data samples, phasor samples). Instead of using phasor samples, the WG suggested using phasor estimate, phasor measurement, or phasor frames.

The configuration and data binary message formats were discussed briefly. It was noted that the different kinds of triggers were not explained clearly. S. Anderson will continue with his write-up with help from B. Dickerson and J. Salj.

The WG discussed using the message number or the fractional time with regards to the fraction of second term. The WG does not have agreement on this issue. M. Adamiak will provide the IEC “Fraction of Second” usage/definition and e-mail to the WG.

The handout listing all of the Draft 3.20 comments was discussed.

- Regarding Page 5, 1.1 Scope (GabB), the WG accepted the proposed change. The standard will add definitions for “Steady-state” and “Transient state” to Section 3.
- Regarding Page 6, 3.0 Definitions, the Nyquist rate, anti-aliasing, and phasor modulus terms will be reviewed with regards to the IEEE Dictionary definitions. [Action: D. Hamai]
- Regarding Section 3.7, the WG agreed to omit the clause “...through the GPS system.”
- The WG accepted the proposed change for Section 4.1, page 6 (AP) regarding the paragraph ending with “...signals.”
- The WG did not accept the proposed change for Section 4.1, page 6 (AP) regarding the word “instantaneous”.
- Comments for Section 4.2-3 (BD) were assigned to K. Martin.
- Regarding Section 5.1, page 9, paragraph 5 (GabB), the WG discussed the proposed definition for response time. G. Benmouyal and V. Skendzic agreed to provide a write-up.
- The WG discussed combining Annex C and Annex G. B. Dickerson, V. Skendzic, G. Benmouyal, and R. Yonker agreed to review and provide a write-up.
- Regarding Annex D, S. Anderson and K. Martin agreed to review and provide a write-up.
- A new Annex addressing the CRC was suggested. S. Anderson agreed to provide a write-up.
- A new Annex on communication protocols was suggested. M. Adamiak and R. Yonker agreed to provide a write-up.

H14: Telecommunication Terms Used by Protection Engineers

Chairman: Roger Ray

Vice Chairman: Ray Young

Established: ?

Output: Report

Expected Completion Date: ?

H14 met on Tuesday, January 13, 2004. Introductions were made.

There were 6 members and 3 guests present.

The group discussed the direction to go with our task. The conclusion of this discussion was to write a WG report. Mal Swanson took on the task of scanning 3 books of terms and running them thru an OCR Program. The resultant OCR file will be divided into 4 parts. Oscar Bolado, Mal Swanson, Roger Ray and Marc Benou will check over these parts and correct the OCR errors. The goal is to get this completed by mid-March. Then we can put together all the terms into one document to begin reviewing at the next meeting in May. We will need a room for 10-15 people & no projector.

Task Force Reports

HTF1: SWITCHYARD DATA ACQUISITION

Chairman: E. Udren

Established: 1996

Expected Completion Date: 1998

No report available

HTF2: Broadband Communications over Power Line Carrier

Co-Chairmen: Veselin Skendzic and Mark Simon

Established: 2003

Expected Completion Date: ?

The group met on Tuesday with 11 members. Due to travel conflicts, previously scheduled presentation by the PSCC chairman Dr. John Newbury was replaced with a short overview of the BPLC technology presented by Veselin. Mark Simon provided latest update on the FCC activities, while Mark Adamiak gave a presentation on UTC (United Telecom Council) BPLC 'Tele Forum' (originally held on July 30, 2003).

Special credit goes to Mark Simon and Mark Adamiak, for providing valuable help on a short notice, Eric Gunter, for his coverage of latest EPRI efforts, and the group members for a lively discussion.

Due to wide interest in the state of BPLC developments in Europe, we will attempt to see if Dr. Newbury would be available for one of our future meetings.

HTF3: Asynchronous Fiber Optic Multiplexers

Chairman: Bill Higinbotham

Established: 2004

This group met on January 13th with 10 attendees. This was the first meeting of HTF3 to discuss if a working group should be formed to write a standard for short haul fiber connections of low speed asynchronous signals. The discussion was not in favor of such an activity. Attendees are asked to consider the discussion and meet again in St. Louis to make a decision.

Roger Ray or Mark Simon will chair the session in May. A single session with room for 20 people and no A/V equipment will be required.

Liaison Reports

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

The last PSCC meeting with a report is the one at the Summer Power Meeting 2003.

The PSCC had approved in 2002 a new scope statement that is all inclusive:

“Treatment of all matters in which the dominant factors are the application, design, construction and operation of communications systems including all matters necessary to the functioning of such communications systems employed in the generation, transmission, distribution, and utilization of electrical energy and their effects on system operation. Included is treatment of the following:

- Power Line Carrier
- Radio and Other Free Space Communications
- Fiber Optic Communications
- Wire Line Communications including both telephone lines and cables
- Methods of Measurements
- Protection of Communications Circuits and Equipment
- Personnel safety through coordinated application
- Utilization of Communications
- Communications Protocols used in Utilities”

An overall communications tutorial – one recycled from the past – was successfully given. The presentations are to be revised and given again.

The Power Line Carrier Subcommittee is working on the PLC Standard. The responsible WG has physically met at the PSRC meeting to review comments from the ballot on Draft 11. The Chairman reports that the standard should be complete within 2004.

The New Concepts Subcommittee has an Object Registration WG (data communications application layer objects) that is working on a draft paper explaining objects and registration processes. At the Summer Power Meeting in 2002, they had prepared a panel on “System Integration and Object Modeling for Dummies,” but no further data has been reported.

The SONET and ATM WG is writing a paper on SONET and protective relaying; and a panel session on relaying over SONET, ATM, and IP. Venue for panel not yet stated.

The PSCC has submitted new PARs for standards projects on:

- Wrapping overhead cable with optical fiber.
- Hardware for OPGW (optical fiber contained within overhead ground wire)
- Hardware for ADSS (all dielectric self-supporting) optical cable.
- Object registration

Standards and projects update:

367 , *IEEE Recommended Practice for Determining the Electric Power Station Ground Potential Rise and Induced Voltage from a Power Fault*, reaffirmed.

776, *IEEE Recommended Practice for Inductive Coordination of Electric Supply and Communication Lines*, reaffirmed.

1137, *IEEE Guide for the Implementation of Inductive Coordination Mitigation Techniques and Application*, reaffirmed.

1590, *Recommended Practice for the Electrical Protection of Optical Fiber Communication Facilities Serving, or Connected to, Electrical Supply Locations*, new standard approved for publication.

2. Substation Committee - J. Tengdin

See Substation Committee Report by Ken Cooley to the Main Committee

3. IEC TC57 Working Group 10, 11 and 12 Report - E. A. Udren

Refer to minutes of I4 WG in the Relaying Practices Subcommittee Report of these minutes.

I: RELAYING PRACTICES SUBCOMMITTEE

Chair: J. W. Ingleson

Vice-Chair and Webmaster: T. S. Sidhu

1. Introduction: The Relaying Practices Subcommittee (SC) met on January 14, 2004 in Tampa, FL. Introductions were made, and an attendance list was circulated. The recorded meeting attendance was 25 Subcommittee Members and 25 guests. We suspect however that the lists were not circulated through the entire room, and that the total attendance was actually over 50. Please send any additions to the Chair for inclusion in these minutes.

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

3. Items of interest from the Advisory Committee Meeting: The Chairman reported on some brief items from the Advisory Committee meeting.

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

I1: Revision of C37.103, Differential and Polarizing Relay Circuit Testing

Chair: M.S. Sachdev

Vice-Chair: J. D. Huddleston, III

Output: Revision of C37.103-1990

The Working Group met in Monroe Room, Wyndham Westshore Hotel, Tampa, FL. Three members and four guests were present. After self introductions, the Chair reported that the IEEE had mailed the proofs of the guide to his home address but they have not received as yet. He expects that they will arrive by the time he gets home. The final task is to write a summary paper and publish it. Chair and Vice Chair would take a first cut at preparing the paper. The issue of the cost of the published guide was discussed. The general consensus was that the price should be affordable. At the conclusion of this business the meeting was adjourned.

I2: Terminology Usage Review

Chair: M. J. Swanson

Vice-Chair: J.D. Huddleston, III

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

The Working Group met at 11:00 A.M. with 9 Members and three guest present. Mal Swanson chaired the meeting. After self-introductions, the past minutes were approved and the roster updated. One other member not present is actively working on reviews. The following topics were discussed. Terms from IEEE C37.93, the Audio Tones Guide, were again reviewed, and one new word was deleted. After a informational re-circulation, the words should be ready for submittal. Terms in C37.114, Fault Location, were reviewed for the second time, this time with WG

Chairman, Karl Zimmerman. We reached agreement. Next meeting should have terms discussed from C37.110, C57.13.3 and C37.116, and C37.101. We are actively soliciting drafts on several more standards and guides. Fred Friend has agreed to join the Working Group. The meeting was adjourned.

I3: Microprocessor-based Protection Equipment Firmware Control

Chair: R. Beresh
Vice-Chair: D. Weinbach
Output: Recommended Practice

The WG met on Jan. 13, 2004 with 17 Members and Guests in attendance. Assignments were reviewed from the previous meeting. The third draft of our recommended practice was discussed at some length. Discussions were held on parts of the Draft not covered in Madison. Writing assignments were handed out to various members and it is hoped that we will have Draft 4 ready shortly so that all members of the working group can comment prior to the next meeting. The meeting was largely attended by manufacturer representatives. We would highly encourage utility personnel to come and be involved.

I4: IEC Standards Advisory

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

TC 95 Measuring Relays

There are no IEC TC 95 standards projects or open drafts on which to vote or comment in this cycle, so there was no formal business for this meeting. This is in contrast to the blizzard of EMC standards we reported between 2000 and 2003.

Prior to the meeting, the Chairman recirculated the last committee draft (CD) of 60255-27, IEC Safety Standard for Measuring Relays. This is not out for comment at this time but is still under development by the IEC WG, so this would be the time to give comments. PSRC members have lacked the expertise to comment on the mechanical, construction, and materials requirements. We are trying to raise manufacturer interest in and focus on this proposal that reads like a pile of UL standards, but with some different specifics. It will have serious impact on relay design requirements, and on acceptability of existing designs in markets that will require 60255-27. It also could impact the role of utilities in selecting and installing relays that comply with formal industry safety standards.

Appended below is a large excerpt from earlier minutes, giving an overview of the contents of 60255-27.

For the May 2004 meeting in St. Louis, we expect 1 session with 15 attendees and no projector needed.

TC 57 - Teleprotection and Power System Control

WG 10, 11, and 12 have reorganized into a single WG to continue with IEC 61850, Communication Networks and Systems in Substations, which defines a standard protocol for substation control and protection. Status of 61850 sections:

1. Introduction and Overview – International Standard (IS)
2. Glossary – IS
3. General Requirements – IS
4. Systems and Project Management – IS
5. Communications Requirements for Functions and Device Models – IS
6. Substation Configuration Language (SCL) in XML Schema – Final Draft International Standard out for yes/no only vote (FDIS)
7. 1 -Abstract Communications Services Interface (ACSI) Principles and Models – IS
2 – ACSI – IS
3 – Common Data Classes – IS
4 – Logical Node and Data Object Addressing – IS
8. 1 – Mapping to MMS and ISO 8802-3 – FDIS
9. 1 – Sampled Values over Serial Unidirectional Data Link – IS
2 – Sampled Values over ISO/IEC 8802-3 Network – FDIS
10. Conformance Testing – CD

There is a running project for section 7-401 on power quality data, work on communications systems for distributed energy resources, and for hydro plant monitoring and control.

WG 15 is working on cybersecurity issues. There have been multiple efforts within IEEE to coordinate PSCC, Substations, PSRC, and SCC 36 security work with the IEC WG.

Annex – Extract from January 2002 WG I4 Agenda

IEC 60255-27 Protective Relay Family Specific Product Safety Standard - we knew it was coming....

No response to attempts to get US participation - US is out of the WG process.

Will determine new tests for CE Mark - manufacturers' issue.

Driven by EC regulatory process.

Based on Generic IEC 61010 safety standards - not free to change outside that framework.

IEC WG attempts to get a consistent set of requirements out of 60255-5 and 61010.

Looks generally like a UL verification program, but all the specifics are different. (Note - UL 3111 is close to IEC 61010).

Key concept - categories of circuits with regard to voltage and user exposure and safety:

ELV - Extra low voltage - 50 Vac, 75 Vdc

SELV - Safety ELV - ELV and separation from dangerous voltages

PELV - Protective ELV - ELV plus insulation and grounding protection

HLV - Hazardous live voltage circuit

Ways in which user could be exposed and is protected under normal or single-fault conditions determine product design.

Key concept - For insulation design, creepage and clearance, and impulse testing - interaction of Rated circuit operating voltage

Overtoltage category (application environment)

Pollution degree (contaminants, moisture, and enclosure protection

Altitude

Tracking properties rating of insulation surface

Ratings and user exposure to the proximate insulated circuit or conductor (ground, or something else?)

Derived from 60255-5

Overview of Contents

Product must be safe for normal and single-fault (insulation failure) conditions.
Protective ground or double insulation needed between things user can touch and HLV circuits.
Direct contact - test fingers, straight and with joints.
Clearances from circuits that are live or could become live due to a single fault.
Discharge time of capacitive energy storage (50 microcoulombs).
Paint and paper insulation don't count
Labeling for hazardous accessible circuits.
Fault modes of impedance protection.
Protective classes - grounded metal, double or reinforced insulation, hazardous voltages accessible or via single fault.
Verification of ground bonding impedance, and design for long-term performance.
Leakage currents.
Solid insulation requirements and tests.
Creepage and clearance figures, tables, and examples.
Unsafe-voltage control schemes - survive 20 hits from a 2 ohm source.
Tests for single faults of user protection barriers; one of two elements at a time.
Ground disconnection is a fault to deal with.
Controlled devices must be energized - heaters, motors, etc.
Transformer secondaries are shorted. Short hazardous circuit to part when heating occurs.
Put fault on output circuit which can cause fire or hazard.
Heating - wait up to 1 hour for a secondary fault, or up to 4 hours if degradation is still occurring.
Test voltage withstand after single fault.
Electric burn test circuit - 30 to 500 kHz.
Heating and temperature burns - temp rise <65 C; single fault produces no fire, dangerous gases, flying parts.
Mechanical safety - no crush, cut, pierce, or pinch of flesh.
Smooth and round edges - normal and maintenance.
Connections and connectors - strain withstand and relief, cable sizes, IEC wire standards.
Flammability - materials and design.
Enclosure construction for fire protection of non-limited circuits.
Spreading of fire - wrap in flammable material and apply fault.
Requirements for components - this document and IEC component standards.
Supply capacitors; transformers and coil devices (a lot on acceptable construction);
electromechanical components (switches and relays), connectors and terminal blocks;
high-integrity parts. No semiconductor barriers.
Explosion protection; battery concerns.
Documentation, marking and packing requirements.
How to show operating ranges and specs. Fuse type indications.
Type tests - dry heat operating; dry heat storage; cold storage; damp heat operating; shock;
vibration; seismic; bump; clearance and creepage impulse; IP rating (enclosure protection);
hi-pot; insulation resistance; protective ground impedance; ground continuity; materials &
components flammability; thermal continuous withstand; thermal short-time; single fault
conditions.
How to get our arms around this new work - largely outside PSRC expertise - try to involve UL and
get to one program for relay manufacturers.
Problem - interacts with some PSRC C37.90.0 requirements.
Proposal for new Technical Committee on Wide-Area Power System Issues – See .pdf file on
website for scope and discussion for TC8; or see IEC Report for this meeting. Major realignment
potential for many IEC power systems standards.

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

Chair: E. A. Udren

Vice-Chair: P. G. McLaren

Output: New Trial Use IEEE Standard P1331

Draft 11 of C37.92 has been accepted by WG ballot for recirculation IEEE balloting. This will be the second balloting cycle; the first was officially successful. The WG made revisions based on comments received, and anticipates success on Round 2. The WG met to provide a forum for any final comments. We got large non-WG attendance, and gave an impromptu PowerPoint overview of the Standard. This was presented at the Main Committee Meeting on Thursday, and is posted with these minutes. The draft Standard as reviewed at the meeting, is contained in the file that can be downloaded by clicking on the WG web page.

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

Chair: M.M. Ranieri

Vice-Chair: J. Teague

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

The working group met on Jan. 13, 2004 with 11 members and 5 guests. We reviewed our final draft and all the documentation that will be submitted to IEEE for re-circulation of PC37.90D15. Documentation included a list of changes made to D14 to get to our final version D15, as well as the IEEE approved spreadsheet showing all the comments submitted on D14 and the status of these comments.

The WG members in attendance approved Draft PC37.90D15 with only two minor editorial changes required for dates shown in the annex. New WG assignments were issued for WG members to contact those individuals who provided comments for the PC37.90D14 balloting so that we can continue on with the 10 day re-circulation process. Our contact with individuals who voted negative will be via email.

We expect to be able to complete the process of contacting the balloters by month end with a goal of requesting the re-circulation prior to January 31

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

Chair: J. Teague

Vice-Chair: J.T. Tengdin

Output: New IEEE Standard C37.90.3

This WG has completed its assignment and has been disbanded with thanks by the Subcommittee. See WG web page for background information.

I8: Revision of C37.90.1, Standard Surge Withstand Capability Test

Chair: J.G. Gilbert

Vice-Chair: J. Teague

Output: Revision of IEEE Standard C37.90.1-1989(R1994)

This WG has completed its assignment and has been disbanded with thanks by the Subcommittee. See WG web page for background information.

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

Chair: S. Mazumdar

Vice-Chair: S.M. Usman

Output: Revision of C37.105

The WG met on Jan. 13, 2004 with six members and four guests in attendance. The WG agreed to review the applicability of standards for qualifying class IE digital relays and the editorial changes to be made. After these changes are made, the draft standard will be ready for electronic balloting.

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

Chair: M. Nemier

Vice-Chair: M. Bajpai

Output: Revision of IEEE Standard C37.98

There were 6 members and 4 guest in attendance. The major items that were discussed are as follows:

The standard does not currently give any guidance on how to perform the seismic test of a multi-function relay. The standard is written only for single function relays. The group agreed that the seismic capability of all functions of a multi-function relay should be addressed by test or analysis in the seismic qualification report.

Action Item: Steve Kunsman will draft another version of section 5.2 using the draft of section 5.2 rewritten by Terry Crawley.

The standard currently uses 2 msec of contact chatter during the seismic test as the pass/fail criteria for the test. See Section 6.2.4.1. There is modern equipment where a 2 msec change of state may cause a device to actuate.

Action Item: Roy Ball will provide a cautionary statement to be included in section 6.2.4.1 that there is equipment where 2 msec of chatter may be unacceptable.

Harmonize with IEC 60255-21. Marie Nemier provided a review of C37.98 and IEC 60255-21. It was suggested by the group that this comparison be provided as a table in an informative annex

Action Item: Marie Nemier will provide the comparison in a table in conformance with the IEEE style manual.

C37.98 and IEEE 344 currently have different definitions for zpa. Mason Clark suggested to review previous revisions of 344 for a history of the 344 zpa definition.

Action Item: Marie Nemier shall review the 344 zpa definition. The group shall come prepared to discuss how to address the differences in the revision of C37.98.

Action Item: Mario Ranieri shall develop a section to address plant specific qualification versus manufacturer qualification.

Note: All action items shall be completed by April 2004 so that they can be made available to the group for review before the next meeting in May 2004.

I11: Survey of Relay Test Practices

Chair: E. Krizauskas

Vice-Chair: W.G. Lowe

Output: Conference Paper

This working group was disbanded with thanks by the SC. For more information see the WG web page.

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

Chair: M. Meisinger

Vice-Chair: D.R. Sevcik

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

The WG met during the PSRC Jan. 2004 meeting with six members and one guest present. Draft 4a of the revised guide incorporating previously received figures and formatting in IEEE Standards style was distributed, discussed and changes incorporated. Draft 5 of the guide will be balloted by the Working Group members immediately with responses due by Feb. 14, 2004.

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

Chair: M.S. Sachdev

Vice-Chair: B. Mugalian

Output: Guide

The Working Group I13, Revision of C57.13.3 - Guide for Grounding of Instrument Transformer Secondary Circuits and Cases, met in Monroe, The Wyndham Westshore Hotel, Tampa FL on January 13, 2004. Seven members and one guest were present. The minutes of the September 2003 meeting, distributed previously by Email and also distributed at the meeting, were reviewed. One correction will be made before the minutes are approved and forwarded.

Draft 5 of the guide was reviewed by the working group members. All writing assignments have been completed. Sections 2.2, 2.3, Annex B, and Annex C will be revised based on input from Bill Lowe, Ray Young, and Del Weers. These new items will be incorporated into Draft 6 of the guide. The working group will review and comment on Draft 6 by the end of February 2004. The draft will then be ready for balloting by the Standards Association in March 2004.

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

I14: Telecommunication Terms/New Terms Used by Power System Protection Engineers

Chair: T.A. Phillippe

Vice-Chair: R. Young

Output: Special Publication

By action of the SC, this WG was transferred into Relay Communications (H) Subcommittee. Reports of this group will no longer appear under this SC.

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

Chair: G.P. Moskos

Vice-Chair: B. Jackson

Output: Revision of IEEE C37.110-1996

The WG met on Jan. 13, 2004 with 7 members and 6 guests in attendance. Draft 5 was reviewed and editorial changes were noted. Draft 5 has been submitted to the IEEE for the pre-ballot review. The editorial review will be completed by the 1st week of February 2004. The electronic balloting process will begin by March 2004. The working group is targeting completion of the guide in 2004.

I16: Understanding Microprocessor-Based Technology Applied to Relaying

Chair: M.S. Sachdev

Vice-Chair: R. Das

Output: Guide

The tenth meeting of the Working Group was held at 11:00 AM on January 13, 2004 in Adams Room, Wyndham Westshore Hotel, Tampa, FL. Nine members and seven guests were present. The minutes of the September 2003 meeting held in Madison, WI were approved as circulated by e-mail and posted on the web site.

The result of the ballot was discussed. There was one negative ballot, which was resolved during the meeting. It was decided to post the remaining editorial suggestions and circulate the report among the members of the I-subcommittee for comments of substance.

It was agreed that the report be submitted to the PSRC officers for approval after the comments of substance are taken care of.

At the conclusion of this business the meeting was adjourned

I17: Trends in Relay Performance

Chair: W.M. Carpenter

Vice-Chair: J.D. Wardlow

Output: Special Report

The working group met on Jan. 13, 2004 with six members and three guests. The 2003 system relay performance for three companies was presented. 2003 data from other companies should be completed by March 1, 2004. The paper will be ready for review at the May 2004 meeting. Reference: The working group report "Transmission Relay System Performance Measuring Methodology," dated 9/16/1999, is available, and is contained in a single file named "Performance Measure Final.pdf". To obtain this report, please go to the WG web page.

I18: Harmonization of IEEE C37.90.2

Chair: J. Burnworth

Vice-Chair: W. Higinbotham

Output: Revision of C37.90.2

The WG did not meet in Tampa (Jan. 2004 PSRC Meeting). Balloting is presently in process on the revised standard.

I19: Analysis of Substation Data

Chair: L.E. Smith

Vice-Chair: B.A. Pickett

Output: Special Publication

This WG was disbanded with thanks by action of the Relay Practices SC on May 22, 2002. The I19 final report is available on the WG web page.

5. Task Force Reports:

ITF1: Relay Service Letter Database

Chair: J.W. Ingleson

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

ITF2: The former ITF2 has become WG I3.

ITF3: Conducted Electromagnetic Interference

Chair: W. Higinbotham
Vice-Chair: J. Burnworth

This TF has been disbanded with thanks by action of the Subcommittee.

ITF4: Optical Current and Voltage Sensor Systems

Chair: H. Gilleland
Assignment: Report to Subcommittee

The Task Force met on Jan. 13, 2004 with 22 in attendance. The scope of the proposed working group was discussed. The scope will be presented to the Subcommittee in May 2004 meeting in St. Louis. The task force also discussed the pros and cons of developing a Guide and finally decided that it will be a Guide. The title will be "Guide for Application of Optical Current and Voltage Sensors Systems for Protective Relaying". Bruce Pickett will be the Vice-Chair.

HITF5: Common Formats for Protection IED Data

Chair: A.P. Apostolov

This work is mainly in the scope of the Relaying Communications Subcommittee and has been transferred to that group. Reports will no longer appear under this SC.

6 & 7. Liaison and Coordination Reports:

Instrument Transformers SC of the PES Transformers Committee and Revision of C57.13-1993, IEEE Standard Requirements for Instrument Transformers:

Here are my Liaison and Coordination Reports concerning the Instrument Transformers Subcommittee of the Transformers Committee. The Transformers Committee last met in Pittsburgh this past October. The Minutes for the that meeting are not yet available.

Liaison from the Instrument Transformers Subcommittee: I have nothing new to report at this time.

Coordination for W.G. PC57.13 (Revision of the C57.13 Standard: General Requirements for Instrument Transformers (Tom Nelson, Chair)

Although this document was balloted for re-affirmation, I have seen nothing new on it.

Coordination for W.G. PC57.13.6: Instrument Transformers for Use with Electronic Relays and Meters, (Chris Ten-Haagen, Chair): This document has been balloted.

See the Transformers Committee web page at <http://www.Transformerscommittee.org> for further details.

James D. Huddleston, III

P384-NPEC, Standard Criteria for Independence of Class 1E Equipment and Circuits

M. Bajpai - No activity on this item.

8. Old Business: There was no old business discussed at this meeting.

9. New Business:

Ljubomir Kojovic suggested that a TF be formed to discuss preparation of a report of guide or report on protection applications of Rogowski coils. There was general agreement that this was a good idea. The Chair will complete arrangement for holding a TF meeting at the next PSRC meeting in May.

J: ROTATING MACHINERY PROTECTION SUBCOMMITTEE

Chair: S. P. Conrad

Vice Chair: W. G. Hartmann

The subcommittee met with 14 members and 13 guests in attendance.

J1: Revision of C37.106-1987 Guide for Abnormal Frequency Protection for Power Generating Plants

Chair: G. Benmouyal

Vice Chair: E. Fennel

The Working Group (WG) did not meet in Tampa because there were no issues to discuss.

The document is in the process of final editing. The official document should be published in February.

The WG will be disbanded by the next meeting.

J3: Protection of Generators Interconnected with Distribution System

Chair: E. Fennel

Vice Chair: R. Pettigrew

The Working Group (WG) met with 14 members and 21 guests.

The WG reviewed comments to Draft 3 of the proposed paper. Due to the extensive comments received from Cummins, the May 2004 WG meeting will be used to complete this review. Writing assignments were made to modify the paper based on the comments and WG suggestions.

J4: Revision of C37.102 AC Generator Protection Guide

Chair: M. Yalla

Vice Chair: K. Stephan

The Working Group (WG) met with 10 members and 14 guests in a double session.

Draft 3 of the guide was issued in December to the WG for consensus comments. This draft was circulated in the meeting and the received comments were reviewed. Major discussions included comparison of the two methods of loss-of-excitation protection, reach restrictions and possible benefits of load encroachment utilized on the backup phase distance protection, protection philosophy up to double contingency, review of calculations in the new Annex, and general comments on figures and citations.

writing assignments are due February 13, 2004. The WG Chair intends to submit for ballot by mid-year.

J5: Generator Protection Setting Criteria

Chair: C.J. Mozina

Vice Chair: M. Reichard

The Working Group (WG) met with 14 members and 6 guests.

All sections of the transactions paper have been completed with the exception of the Conclusions and References. The majority of the meeting was spent reviewing Draft 4 of the paper. The paper is currently in the editing/review process. The following WG assignments were made. All WG assignments are due to the Chair by March 15.

Gerald Johnson, Mike Thompson and Steve Conrad were added to the WG.

Assignments:

1. Joe Uchiyama to research correct verbiage "MEL" or "UEL" per Std. 421-1.
2. Mike Reichard to revise Fig. 4 to include operation of example generator at all gas cooling pressures. Mike will also revise Fig. 5 to show center and radius of SSS limit.
3. Don Sevcik to add discussion regarding OEL and capability curve
4. Chuck Mozina will put Sections IV and V in the same format as Section VI by Feb. 15 so these sections can be reviewed by WG members cited below
5. Prem Kumar and Irwin Hasenwinkle to review Section IV. They are to add verbiage about hydroelectric synchronous condenser operation (plotting SSSL, MWEL and GCC and 0.95 pu voltage)
6. Mike Thompson and Gary Kobet to review Section V. Review loss of field calculation and add plotting of limiters in both P-Q and R-X diagrams (Figs. 7 & 8)
7. Mike Thompson and Mike Reichard to review section VI and incorporate discussion of apparent impedance into this section of the paper
8. Gerald Johnson and Terry Crawley to review section VII
9. Chuck Mozina to write Conclusions and References sections to complete the paper

J6: Performance of Generator Protection During System Disturbances

Chair: S. Patel

Vice Chair: K. Stephan

The Working Group (WG) J6 met with 7 members and 11 guests.

The paper has been submitted and accepted as a Transactions paper by the IEEE. The paper is awaiting publication. The paper is available on the PSRC website until it is published by the IEEE. It was felt that the summary presentation made at the September Main Committee Meeting by chair Subhash Patel went well.

Discussed the possible affect of the August 14, 2003 blackout event on this Working Group. The WG felt at present, there is not enough technical information available to warrant an addendum or additional work to the J6 paper. However, it was emphasized that a NERC report is forthcoming on the recent blackout. It was agreed that the WG should continue and review this report. In addition, the June PES meeting invited the PSRC "J" Subcommittee to participate on a panel regarding the August 14 event. Excerpts from the J6 paper were submitted as possible contributions.

Discussed presentation at future relay conferences. Again, it would be beneficial to wait until more information is released on the August 14 event. Presentation now would surely generate questions better answered after more information becomes available.

Discussed underfrequency protection in relation to hydro units and system support vs. machine protection.

J7: Revision of C37.101, Generator Ground Protection Guide
Chair: J.T. Uchiyama
Vice Chair: R. Das

The Working Group (WG) met in a single session with 8 members and 7 guests.

The WG reviewed the revised document, plus additions to the document, in the following areas:

1. Inserted a paragraph regarding multifunction relays related to this document
2. Section 18.a, Chuck Mozina brought up the necessity of supervision during load rejections. This is due to the 3rd harmonic contents changes that can occur during overfrequency caused by load rejection
3. Section 18.d, Dale Finney will check/revise this section for appropriate device numbers. Pat Kerrigan will rewrite this section to reflect use of multifunction relays (the existing paragraphs and figures are based on discrete solid state relays)
4. Annex A.1b, the existing document's treatment of the grounding transformer calculation did not have a derating factor. WG decided to put as note, "Some users include a derating factor for the selection of grounding transformer size [kVA])
5. Section A.3.5.2 (Scheme 18.c), this section was inserted to address one of the comments regarding procedure of how to set up this scheme. Phil Waudby's 3rd harmonic measurements will be a good reference for use in this document.

Assignments are to be turned into the Chair by February 15, 2004.

JTF1: "Protection of VFD Motors" Task Force
Chair: J. Gardell
Vice Chair: R. Das

The Task Force (TF) met in a single session with 6 members and 3 guests.

The subject of the meeting was to establish the next step(s) to be undertaken to meet the intent of the TF assignment. The TF decided to approach this by working with one or two specific applications of drives with motors in existing projects. Prem Kumar and Terry Crawley volunteered to provide the TF with two applications from existing projects being undertaken by their respective companies. The TF will then decide which to undertake, or perhaps undertake both.

It was felt that this approach may work well to ferret out the specifics of protection embedded in drives that needs to be understood versus protection applied externally. The TF will review the supplied information and engineering data during the next TF meeting including identifying specific additional data and information requirements to proceed.

Liaison Reports
Electric Machinery Committee

C.J. Mozina

EMC met at the PES Meeting in Toronto in June 2003. The meeting minutes have not yet been posted on the Committee's website. To make sure we are using the latest revision in C37.102 (WG J4) update Chuck Mozina will contact Jim Michalec (AEP) of EMC to obtain the latest revision of C50.12 and C50.13./

Coordination Reports

P958-EDPG, Guide for Adjustable Speed Drives

J. Gardell

No report.

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

R.V. Rebbapragada

No report.

P1010, Guide for Control of Hydroelectric Power Plants Wayne Hartmann

Coordination complete.

K: SUBSTATION PROTECTION SUBCOMMITTEE

Chair: C. R. Sufana

Vice Chair: F. P. Plumptre

The Subcommittee met Wednesday January 14, 2004, at Tampa, Florida with 16 members and 19 guests attending. The minutes of the previous meeting in Madison were approved.

ITEMS OF INTEREST FROM THE ADVISORY COMMITTEE MEETING:

Charlie Sufana reported:

1. Each sub committee is to plan for doing one technical talk per year at the main committee meeting. For 'K' our schedule is September 2004 - 20 to 40 minute presentation.

Charlie Sufana offered to make a presentation on the Network Protection Guide for the September 2004 main committee meeting

Note in general, the intent is for all WG's to make a presentation when they complete their tasks.

2. All PARs done on line now

Reports from the WG Chairs

K1: REVISION OF C37.91 – IEEE GUIDE FOR PROTECTING POWER TRANSFORMERS

Chair: Mohindar Sachdev

Vice-Chair: Pratap Mysore

Established: 2003

Output: Subcommittee Report

Expected Completion Date: 2008

K1 working group met in one session on January 14, 2004 with 10 members and 15 guests. The standards board has approved the PAR. Several writing assignments received from the members were discussed and new assignments were made. All writing assignments are due by March 1, 2004. Draft 1 of the guide will be available before the May 2004 meeting.

WG plans to meet in one session at the next meeting with a seating capacity for 40 participants and with a computer projector.

K2: BREAKER FAILURE PROTECTION

Chair: R.A. Hedding

Vice Chair: A. CHAUDHARY

Established, 2001

Output: ANSI C37.119

Expected Completion Date: 2006

Draft 3

K2 met with 31 members and 22 guests in a single session Tuesday morning, Jan.13th. Draft 3, which was distributed prior to the meeting, was discussed with specific emphasis on the latest writing assignments

No further additions will be accepted for the guide as we are approaching the time we should be finishing up technical comments and editing (Dec. 2004) So the guide can be submitted for balloting, So we complete before the PAR expires (Dec. 2005).

All working group members were asked to review the guide, and submit technical and editorial comments prior to the next meeting.

A single session is needed for the next meeting. Computer projector also.

K3: REDUCING OUTAGES THROUGH IMPROVED PROTECTION AND AUTORESTORATION IN DISTRIBUTION SUBSTATIONS

Chair: B. Pickett

Vice Chair: T. Sidhu

Established, 2002

Output: Paper

Draft 3

Met 1-14-04 with 9 members and 17 guests.

Draft 3 was reviewed.

Five writing assignments were made.

Tarlochan Sidhu- UCA

Arvind Chaudhary- Peer-to-peer communications

Craig Wester & Bogdan Kasztenny-

Mike Jensen- Secure sudden pressure trip scheme

Charlie Sufana- ComEd history; transformer loading; communications

All attendees were asked to review existing document with the following questions in mind:

1. What can be done to prevent the outage from occurring in the first place?
2. If an outage occurs, what can be done to shorten the outage time? Autore restoration stuff?

3. How can the data being gathered be used in the restoration of transformers, busses, feeder breakers?
4. What needs to be considered as permissives, requirements, etc.?

Next meeting- single session for 30; computer projector

K4: BUS PROTECTION GUIDE

Chair: S. P. Conrad

Vice Chair: R. W. Haas

Established, 1999 (Originally 1983)

Output: Revision of Standard ANSI C37.97

Expected Completion Date: 2004

The K4 WG did not meet in Tampa.

The draft document is to be submitted to the Standards coordinator and the I2 WG (Terms and Definitions). Once the document has been accepted a balloting pool will be assembled and the document will be balloted.

KTF5: APPLICATION OF COMMON PROTECTIVE FUNCTIONS IN MULTI-FUNCTION RELAYS

Chair: Irwin Hasenwinkle

The Task Force on the Application of Common Protective Functions in Multi-function relays met on January 13, 2004. There were 25 persons in attendance. The purpose of the Task Force was to determine whether a Working group should be formed to develop a document that addresses the problems and opportunities in the application of the various functions, such as breaker-failure, synchronism check, automatic reclosing and oscillography, that can be common to micro-processor based protective relaying used in power systems.

There was discussion concerning these functions and various examples of the types of concerns that should be considered were posed. A consensus evolved among the attendees that a document discussing these problems would be useful to the industry.

It was generally felt that a Web-published report would be the most useful since it would be readily accessible and could possibly be updated, if needed.

The proposed assignment for the working group is as follows:

“Develop a document that addresses the considerations in applying the protection and control functions that can be common in modern micro-processor relays and the integration of these functions into the overall protective system in order to reduce duplication, improve reliability and enhance simplicity.”

The attendees felt that the document should address the following specific topics:

1. Breaker failure
2. Automatic reclosing
3. Synchronism check
4. Voltage monitoring
5. Oscillography and event recording

6. Remote and local breaker control
7. Breaker tripping
8. Duplicate Protective schemes

It is understood that Simon Chano is interested in being chairman of the working group. Dean Miller volunteered to be vice-chairman.

K7: GUIDE FOR THE PROTECTION OF SHUNT REACTORS.

Chair: K. A. Stephan

Vice Chair: P. G. Mysore

Established, 1999

Output: Revision of ANSI/IEEE C37.109.

Expected Completion date: 2004

Status: Reviewing Draft 9.1

The Working Group met on Tuesday, January 13, 2004, in one session with 2 members and no guests. There was not much to discuss at the meeting as the document is in the process of pre-editorial review. Draft 9 was made after the Madison meeting (September 2003). In the process of electronically submitting the document for IEEE pre-editorial review, the website referred to a checklist to be done before uploading. Draft 9.1 incorporates minor changes to accommodate the checklist and will be uploaded to the IEEE for pre-editorial review.

Next Meeting: Single Session 15 people, no A/V

K10 (Ex KTF1): SCC21 Distributed Resources Standard Coordination

Chair: William Feero

Vice Chair: Jerry Johnson

Established, 1999

Expected Completion Date: 200x

Output: Standard through the SCC 21

The K10 meeting was attended by nine members (of a possible 50) and seven guests. Three members informed the chair of overriding conflicts prior to the meeting. However, the attendance at K 10 meetings seems to directly correlate with how close a P1547 ballot is to being issued. The membership should recall that our scope is to provide timely input to the P1547 working groups. It is not to complain about inadequacies at the 11th hour.

Joint members of K 10 and the working groups;

- P1547.1 Standard for Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems,
- P1547.2 Application Guide for IEEE P1547 draft Standard for Interconnecting Distributed Resources with Electric Power Systems, and
- P1547.3 Guide for Monitoring, Information Exchange, and Control of DR Interconnected with Electric Power Systems

Gave updates of the status of each of these P1547 efforts. Of particular note was that P1547.1 is close to going out for ballot. It is expected that Draft 4 will be issued in early spring 2004. The next meeting of P1547 usually follows the issuance of a draft by about three weeks. I will need the

comments back before going to the meeting. A K10 task group consisting of Tony Napikoski, Pratap Mysore, Murty Yalla, Pat Carroll, and Chuck Mozina have volunteered to review Draft 4 or have someone in their organization involved in testing do the review. The chair of P1547.1 requires that any reviews submitted must use the IEEE P1547.1 Comment Form (included at the end of this report) when submitting comments.

The balance of the meeting was devoted to providing P1547.2 inputs for relay application advice for two sub-clauses of P1547.2:

- 8.1.5 Inadvertent Energization of the Area EPS
- 8.2.5 Loss of Synchronization

Most of the members agreed that the undervoltage function that is mandated as part of the Standard 1547-2003 interconnection package could provide inadvertent energization protection. It will be necessary specify that the undervoltage function maintain the trip contact until voltage is restored.

It was also thought that the undervoltage function would generally cause DR units to trip for any fault condition that might result in fault-induced loss of synchronism. However, this approach is neither proven nor is it an actual loss of synchronism detection function. While techniques applied to large generators was discussed and expected to work, they were not discussed in terms of cost-benefits. More thought needs to be given to this subject. Further comments would be appreciated.

As a general assignment to K 10, its members were asked to review Standard 1547-2003 and list the sub-clause numbers in Clause 4 for which the PSRC should provide input to the P1547.2 working group as they develop their guide for applying Std 1547-2003. The criteria is should not could. The chair would like these lists by Jan 30, 2004.

IEEE P1547.1 --- Comment Form

11/14/03

Please fill the following form for each comment.

Commenter Name:
Commenter Company:
Commenter email:
Type of Comment: (Editorial or Technical)
Draft Number of P1547.1:

Clause Number of P1547.1 and original text:

Comment:

Resolution

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

Chair: F. P. Plumptre

Vice Chair: Dan Hamai

Established, 1999

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

Expected Completion Date: 2005

Draft 7

Working group K13 met at 3:00 PM on Tuesday January 13. Five Members and 5 guests were present.

Draft 7.0 of the guide was distributed. The WG discussed written contributions on Duty Cycle, Protection Considerations, and Testing. WG members will provide additional entries for the references and definitions sections. An editing group was formed to review each section for style and completeness,

The next draft will be circulated in early May. Following the May PSRC meeting, the WG members will be balloted for approval

Liaison Reports:

1. Transformer Committee, J.D. Huddleston III -

The Transformers Committee last met in Pittsburgh in October 2003. The Transformers Committee website is <http://www.Transformerscommittee.org> . The next Transformers Committee meeting will be in April 2004 in San Diego.

Coordination Reports:

All coordination reports will be available after the January 2003 meeting.

1.a) ANSI/IEEE Switchgear Standards F. Plumtre.

No update

b) C37.100.1, Common Requirements for IEEE Power Switchgear Standards F. Plumtre

No update

2. PC62.91-SPD, Revision of IEEE 32 Requirements, Terminology, and Test Procedures for Neutral Grounding Devices, D. C. Dawson.

No update

3. P1375 Guide for the Protection of Large Stationary Battery Systems, Steve Conrad

No update

4. P1409 Guide for Application of Power Electronics for Power Quality Improvements on Distribution Systems Rated 1 kV through 38 kV, Steve Conrad

No update

5. P1106 Recommended Practice for Installation, Maintenance, Testing and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications, Steve Conrad.

No update

6. PC37.74 Standard Requirements for Subsurface Vault, and Padmounted Load-Interrupter Switchgear and Fused Load-Interrupter Switchgear for Alternating Current Systems up to 38 kV, Roger Hedding.

No update

7. ANSI/IEEE Switchgear Standards, Vittal Rebbapragada

a) PC37.30.01 Standard Requirements for High Voltage Air Switches, Switching Devices, and Interrupters.

No update

b) PC37.100.1 IEEE Standard of Common Requirements for Power Switchgear.

No update

8. PC37.20.1 Standard for Metal Enclosed Low Voltage Power Circuit Breakers, Irwin Hasenwinkle

No update

Old Business

No old business

New Business

1. Discussion on KT5 " APPLICATION OF COMMON PROTECTIVE FUNCTIONS IN MULTI-FUNCTION RELAYS"

It was agreed by Sub-committee members that a WG be formed (to be designated K5). The assignment is as follows (slight revision from the KTF5 task report)

"Develop a report for the PSRC that addresses the considerations in applying the protection and control functions that can be common in modern micro-processor relays and the integration of these functions into the overall protective system in order to reduce duplication, improve reliability and enhance simplicity."

Simon Chano is appointed chair of the WG; Dean Miller is appointed vice-chair.

2. Roger Hedding asked the subcommittee about practices regarding circuit switcher failure protection. Discussion followed in the meeting regarding different utility practices.

3. Jerry Johnson is now a member of the Subcommittee.