

**POWER SYSTEM RELAYING
COMMITTEE**

OF THE

IEEE POWER ENGINEERING SOCIETY

Preliminary/Unapproved Rev. 1

MINUTES OF THE MEETING

January 7-10, 2002

Dana Point, CA

**Power System Relaying Committee
Main Committee Meeting Agenda
January 10, 2002
Revised (1-10-02)**

Dana Point, CA

- | | | |
|--------------|--|------------------|
| I. | Call to order / introductions | Nail |
| II. | Approval of Minutes/ Financial Report | Winston |
| III. | WG Report- H7 WG Standard for N times 64 kilobit per second Optical Fiber Interfaces between Teleprotection and Multiplexer Equipment (C37.94/D6) | Fodero |
| IV. | Shunt Capacitor Protection | Chano |
| V. | Reports of Interest | |
| | A. Chairman's Report | Nail |
| | B. Technical Paper Coordinators Report | Taylor |
| | 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 | Tengdin |
| VI. | Subcommittee Reports- in order | |
| | H - Relaying Communications | Simon |
| | I - Relaying Practices | Gilbert |
| | J - Rotating Machinery | Pettigrew |
| | K - Substation Protection | Chano |
| | D - Line Protection | Carpenter |
| | C - Systems Protection | Novosel |
| VII. | Old Business | Nail |
| VIII. | New Business | Nail |
| IX. | General Announcements | Nail |

Adjourn

Call to order / introductions**Nail**

George Nail called the meeting of the IEEE/ PSRC Main Committee in Dana Point, CA to order at 7:02 AM on January 10, 2002.

Approval of Minutes – Madison meeting and misc.**Winston**

The revised minutes of the September 2001 in Madison, WI were approved.

Chairman's Report**Nail**

Beginning in 2003 PES will no longer hold a Winter Power Meeting, so we have invited the Power System Communications Committee to hold their winter meeting in conjunction with our January meeting. This should give both of our committees the opportunity to interact with working groups of mutual interest. We will probably need to schedule some of their meetings on Monday similar to what we do when we meet with Substations in September. Therefore, be sure to make your room reservations and flight arrangements accordingly. We will try to remind everyone at our upcoming meetings and in the meeting notices.

As we discussed in the Main Committee Meeting, the IEEE Directory will no longer include membership of the Subcommittees and Working Groups. The reason given was that most of the committees are not diligent about keeping the information current. Even though PSRC was keeping current and fought to retain it as in the past, we lost out. Since it was felt that this listing could be and was being used by many of our members to justify their participation in PSRC, we decided to list the membership of subcommittees and working groups on our web page. When you look at the modified Subcommittee Web Pages, you will see a new Hot Button for membership. Only names and company affiliations are listed.

I was very happy to see over 170 registrants, plus spouses, attend the Dana Point Meeting. Thanks to all that attended for making it a very successful meeting.

Technical Paper Coordinators Report**Taylor**

The next conference for which technical paper sessions have been coordinated is the PES Winter Power Meeting, scheduled for late January in New York City. There will be one exclusively PSRC session to be chaired by Moh Sachdev. It is scheduled for Wednesday, January 30 from 9:00am until noon. The theme of this session is Reliability, Quality, and Standards.

A joint session with the Transmission & Distribution Committee is scheduled for Wednesday afternoon from 2:00pm until 5:00. Alex Apostolov will chair this session with papers addressing the theme of Emerging Technologies.

Another joint session, this one with the PSACE committee, will be held on Thursday afternoon from 2:00 until 5:00. Rick Taylor will chair this session with papers covering the theme, Future Role of Information Technologies.

PES Report**John McDonald**

The IEEE PES Executive Committee met on Friday, November 2, 2001 in association with the 2001 IEEE PES Transmission and Distribution Conference and Exposition in Atlanta, Georgia. This report will summarize the highlights of the meeting.

2002 Executive Committee (ExCom) Meetings

The PES Executive Committee (ExCom) meets twice each year, in addition to the two Governing Board Meetings at the PES Winter and Summer Meetings. In 2002, ExCom has scheduled the two meetings to support regional PES T and D meetings. In the Spring ExCom will meet Thursday, March 21 in Sao Paulo, Brazil during the IEEE PES T and D – Latin America Conference and Exposition March 18-22. ExCom will also participate in the Region 9 Chapter Chairs Meeting following the T and D Conference on March 22-24. In the Fall ExCom will meet Thursday, October 10 in Yokohama, Japan during the IEEE PES T and D – Asia Pacific Conference and Exposition October 6-10.

2002 PES Goals

ExCom met during the IEEE PES T and D in Atlanta on Thursday afternoon, November 1 to discuss and establish goals for 2002. John Estey, PES President, led this goals setting session. In addition to setting the goals, ExCom established responsibilities for achieving the goals, and determined metrics to track progress. John Estey will present the 2002 goals to the PES membership during the PES General Membership Meeting on Monday morning, January 28, 2002 during the PES Winter Meeting in New York.

Executive Director Position

Advertisements have been run and information has been posted on the PES web site about the search for a new PES Executive Director. After initial screening of the received resumes, there are a handful of candidates who appear qualified. Additional advertisements will appear in November to attract more candidates. There is no firm cutoff date yet. The difficulty in finding qualified candidates is the requirement they have a technical background and experience in PES activities in addition to substantial managerial experience.

IEEE Financial Situation

The IEEE President's Blue Ribbon Committee (PBRC) on Governance Report suggested five recommendations for change in IEEE governance structure. There are systemic problems in the IEEE Board structure. There are many vested interests and constituencies in the IEEE and the odds of the recommendations being implemented are very slim. There have been three financial modeling committees and none of their recommendations have resulted in implementation of changes. An article by Ben Wah, Computer Society President, appeared in the November issue of *Computer* magazine, and provides an interesting, provocative, and challenging discussion very germane to the financial health of PES as well as all IEEE Technical Societies. Twenty Society Presidents took a position on the IEEE financial situation and sent a letter to IEEE President Joel Snyder. The letter was intended to address the organization problems and associated maladies that have led to the occurrence of the financial situation at IEEE and the lack of leadership action to resolve it.

New PES Awards

In conjunction with the current FACTS Award, PES approved the new Custom Power Award. Power electronics and other static controllers are making a major impact on power systems through application in transmission, distribution, and small generation. Applications in transmission and distribution include HVDC, FACTS, and Custom Power. The FACTS and Custom Power Awards are for individuals who have made a major contribution to the state of the art of FACTS and Custom Power technologies and their applications.

Presently there is no IEEE PES award for high voltage power system engineering. This point is emphasized by the fact that one of the most prestigious power system engineers, Charlie Concordia, did not receive a PES award until he was 84 years old. This was the Power Life Award in 1992. In 1999, he received the IEEE Medal of Honor for "outstanding contributions in the area of power system dynamics." PES must recognize outstanding high voltage power system engineers earlier in their careers. The new award is the Charles Concordia Power Systems Engineering Award. Nominees for the award must have been an IEEE PES member for ten years with tangible and visible achievements in one of the following areas of high voltage power system engineering: operations, planning, control, modeling, analysis, and interaction with turbine generators.

Streamlining the Transactions Paper Review Process

The IEEE platform for paper review, Manuscript Central, is now available for use by PES Headquarters, the Editor-in-Chiefs (EICs), Editors and Reviewers. The IEEE Publications Department will make arrangements to demo the functionalities of the Manuscript Central platform at PES meetings as well as major committee meetings held independently of the general meetings. PES is now getting ready to be a part of the full-featured (version 2.0) Manuscript Central platform, which will allow paper submission directly by the author, electronic reviewing and tracking of papers as they pass through the system.

Upcoming Board Meeting

The IEEE PES Governing Board will meet on January 31, 2002 in New York, New York in conjunction with the 2002 IEEE PES Winter Meeting.

CIGRE SC34 Report

Cease

TC 95 - Measuring Relays

We've reported regularly on the blizzard of TC 95 standards drafts - driven by European Community pressure to develop the all-inclusive suite of environmental susceptibility tests for relays. Now, as we previously warned, comes the next wave...the first draft of the IEC Product Safety Standard that is specific to protective relays. Recall that we solicited for potential US participants in the IEC WG, which required ability or support to travel to some meetings in Europe, and could not get anyone.

- **First Committee Draft IEC 60255-27 Product Safety Requirements for Measuring Relays and Protection Equipment**

This is the subject of deliberation at the IEC Advisory WG during the next few months, and probably well beyond. When complete, this will determine new tests for compliance to the EC Low Voltage Directive for CE Mark - a giant manufacturers' issue. The development, and the specific contents, are driven by the EC regulatory process and will bind member nations. No one from the US has been willing or able to participate, so the US is out of the WG development activity. The IEC WG attempts to get a consistent set of requirements out of 60255-5 on insulation requirements and tests for relays; and 61010 generic safety standard - they are legally not free to wander outside that overall standards framework. This massive draft looks generally like a UL safety verification program, but most of the specific requirements are different. It has 96 Pages of detailed requirements and tests for circuit definition, rating, and separation, grounding, insulation, single-mode insulation failure tests, materials, fire and explosion containment, access and exposure of hazardous circuits, misuse and misconnection, overheating and burns, and much more. A problem is that this new draft may conflict with some C37.90.0 requirements. Our key question at PSRC is how to get our arms around this new work - much of this subject matter is outside PSRC expertise, yet it is relay-specific and will be required for design of all relays to be sold on the world market. One strategy is to involve UL, and reach one

safety qualification program for relay manufacturers for the US and the world. Utilities have not required UL or specific safety standards in the past - we can speculate on how long this can continue, given that the focus of the new standard is on safety of those who are working with the relays, generally utility employees.

- **Voting Draft - 60255-22-7 Power Frequency Immunity Tests**

This EMC test applies power frequency voltage through an RC network to dc contact or sensing inputs for 10s. The product must show no unwanted response, or harm to circuits. Apply 100 to 300 V differential mode & common mode through the RC network. We have discussed prior drafts. There is no corresponding IEEE standard.

The IEC accepted our last comments on clarification of classes of tests for different application environments.

The next plenary meeting of TC 95 is with the overall IEC Meeting in October in Beijing.

TC 57 - Teleprotection and Power System Control

WG 10, 11, and 12 continue work on IEC 61850, Communication Networks and Systems in Substations, which defines a standard protocol for substation control and protection, including alternate communications stacks to be used with a standard substation-defined object-oriented user layer.

Many PSRC members and attendees also follow or take part in this work, which is attempting to merge with the EPRI UCA substation communications design.

The last meeting of WG10-12 was in Philadelphia in October. All sections of the massive draft are in latter or final international voting cycles, except for Section 10 on conformance testing which needs much work. The next meeting takes place in March, in a US location not yet settled. Implementations of the IEC 61850 & UCA substation communications are to be demonstrated tonight as part of the UCA Meeting immediately following this PSRC meeting.

EPRI Report

Burger

I can't speak for all the EPRI meetings but only for the one, we have planned following the PSRC Main Committee Meeting. Our first joint EPRI sponsored Utility Substation Initiative and UCA Users Group Meeting is planned for noon today. As many of you may know, we are rapidly evolving from the Initiative format to a UCA and eventually, an IEC 61850 Users Group. Following a short meeting, we will have a relay communications and interoperability demo with about 22 vendors and over 100 individuals participating in the room next to ours. We have a box lunch at noon and a buffet dinner planned at 7:30. Everyone is welcome to participate in the activities. UCA board and executive committee meetings are planned for Friday morning. Thanks also to the PSRC for their help in getting us discounted rooms for these activities.

IEC Report

Udren

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Standard Coordinators Report

Sachdev

The Standards Coordinator, Mohindar Sachdev, met with the Chairs of the Working Groups writing and revising standards documents on January 8, 2002 in Dana VI-VII room. The status of PARs, Standards and Guides, reviewed at the meeting, are

summarized in this report. The actions to be taken for keeping the approval of the PARs up-to-date and keeping the Standards and Guides live are identified. A summary of the specific approvals received since the September 2001 meeting of the PSRC and the actions that need to be taken soon 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/>

Other web sites for obtaining useful information are as follows.

Information on	Web site address
PAR application, extension and other forms	http://www.standards.ieee.org/guides/par/
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
Status of standards etc	http://www.standards.ieee.org/db/status/
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/

The new policy in standards developments requires that the implementation of the following metric policy.

Proposed new standards and revised standards submitted for approval shall use metric units exclusively in the normative portions of the standard. Inch-pound data may be included, if necessary, in footnotes or annexes that are informative only.

For more information on this policy, visit

<http://www.standards.ieee.org/announcements/metricpolicy.html>

STANDARD ACTIVITY SINCE THE SEPTEMBER 2001 MEETING OF THE PSRC

The status of the standards approval activities, which have taken place since September 2001 meeting of the PSRC, is as follows.

1. Standards Approved

C37.112 Standard Inverse-Time Characteristic Equations for Overcurrent Relays; approved after successful reaffirmation ballot.

2. Standards submitted for approval

PC37.90.1 Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems; submitted for approval after successful re-circulation.

PC37.108 Guide for the Protection of Network Transformers

3. Standards submitted for balloting

PC37.106 Guide for Abnormal Frequency Protection for Generating Plants: extended to December 31, 2003

4. Standards to be submitted for approval

PC37.95 Guide for Protective Relaying of Utility-Consumer Interconnections was balloted; negative ballots have been resolved. The standard should be submitted to RevCom for approval.

PC37.104 Guide for Automatic Reclosing of Line Circuit Breakers for AC Distribution and Transmission was balloted; negative ballots have been resolved. The standard should be submitted to RevCom for approval.

C37.94 Standard for N times 64 kilobit per second Optical Fiber Interface between Tele-protection and Multiplexer Equipment was balloted – successful with one negative ballot. The negative ballot should be resolved and standard submitted to RevCom for approval.

PC37.115 Standard Test Methods for Use in the Evaluation of Message Communications between Intelligent Electronic Devices in an Integrated Substation Protection, Control and Data Acquisition System – successful with one negative ballot. The negative ballot should be resolved and standard submitted to RevCom for approval.

5. Standards to be submitted for balloting

PC37.92 Standard for Low Energy Analog Signal Inputs to Protective Relays; the standard should be submitted for balloting.

PC37.103 Guide for Differential and Polarizing Circuit Testing extended to December 31, 2003

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

PC37.114 Guide for Determining Fault Location on AC Transmission and Distribution Lines: extended to December 31, 2003

The PARs approved since September 2001, submitted since September 2001, 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.

6. New PAR approved by NesCom

PC37.119 Guide for Breaker Failure Protection of Power Circuit Breakers

7. PAR extension applied for

PC37.92 Standard for Low Energy Analog Signal Inputs to Protective Relays; the standard should be submitted for balloting.

8. PAR extensions approved by NesCom

PC37.92 Standard for Low Energy Analog Signal Inputs to Protective Relays; the standard should be submitted for balloting.

9. PAR extension not approved by NesCom

PC37.90 Standard for Relays and Relay Systems Associated with Electrical Power Apparatus: expired on December 31, 2001. This was a ten-year old PAR. It should be withdrawn and a new PAR application should be submitted.

10. PAR expiring end of 2002

PC37.90.1 Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relays Systems

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

PC37.94 Standard for N Times 64 kilobit per second Optical Fiber Interfaces Between Teleprotection and Multiplexer Equipment

PC37.95 Guide for Protective Relaying Of Utility-Consumer Interconnections

PC37.97 Guide For Protective Relay Applications to Power System Buses

PC37.104 Guide for Automatic Reclosing of Line Circuit Breakers for AC Distribution and Transmission Lines

PC37.108 Guide for the Protection of Network Transformers

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

PC57.13.1 Guide for Field Testing of Relaying Current Transformers

PC57.13.3 Guide for the Grounding of Instrument Transformer Secondary Circuits and Cases

SUBMITTAL DEADLINES & STANDARDS BOARD MEETING SCHEDULE

PAR/Std Submittal Deadline	Standards Board Meeting
February 8, 2002	March 21, 2002
May 3, 2002	June 13, 2002
August 2, 2002	September 12, 2002
November 1, 2002	December 11, 2002

Substation Committee Report

John Tengdin

In December 2001, the IEEE SA Standards Board approved the reaffirmation of C37.2 – 1996 Std Electrical Power System Device Function Numbers and Contact Designations. In the electronic balloting, there were no negative ballots. There were hitches in the electronic balloting process, and a “Lessons Learned” report has been forwarded to the Standards Coordinators of the Substations Committee and PSRC.

Work continues to resolve negative ballots on P1525, with re-balloting to take place in 2002.

Work also continues on updating the SCADA standard. C37.1, to reflect the prevalent use of relays and other IEDs as data sources for SCADA.

At the Winter Power Meeting in New York later this month, work is expected to begin on a new standard to document substation configuration details. The proposed standard will address the connectivity of the power system devices, the connectivity of the IEDs to power system devices, and the connectivity of the IEDs to the communication system in a LAN environment (including hubs, switches, routers, protocol converters, gateways, and firewalls).

OLD BUSINESS

None

NEW BUSINESS

None

FUTURE MEETINGS

May 20-23, 2002:	Pittsburgh, PA	Hilton Pittsburgh
September 9-12, 2002:	Ponte Verdi Beach, FL	Sawgrass Marriott
January 2003	Scottsdale, AZ	Embassy Suites
May 12-15, 2003	Raleigh, NC	Hilton North
September 22-25, 2003	Madison, WI	Madison Concourse Hotel

B: ADVISORY COMMITTEE

Chair: G.R. Nail

Vice Chair: R.P. Taylor

B1: AWARDS AND TECHNICAL PAPER RECOGNITION

Chair: S.P. Conrad

The chairman described the procedures for the work of the committee and the responsibility of the committee. Roger Hedding agreed to fill the vacated position of Vice Chair.

B2: FELLOWS AWARDS

Chair: J.S. Thorp

No activity to report

B3: MEMBERSHIP COMMITTEE

Chair: M.J. Swanson

Attendance was approximately 160, which was as expected. This is within the range of the accommodations capabilities. 14 new attendees were at the newcomer's session on Tuesday morning. I will correspond with them within the next few short weeks. No support correspondence to supervisors was requested.

B4: O/P MANUAL & W.G. TRAINING

Chair: J.C. Appleyard

No activity to report

B8: BIBLIOGRAPHY AND PUBLICITY

Chair: T.S. Sidhu

The 2000 bibliography paper has been accepted for publication in the IEEE Transactions on Power Delivery. Some assignments for preparing the 2001 bibliography paper have been received and the remaining assignments are due by Feb. 15, 2002. Jim Stephens had prepared a report highlighting the year 2001 activities of the PSRC. This report needs revisions and Mal Swanson will make those revisions. The NERC reports for '98,'99,'00 are available at the following site: "<http://www.nerc.com/~filez/dawg.html>" The last hard copy of the published report is 1995. The NERC/DAWG WG is working on getting the 96 and 97 reports available by the end of the 1st and 2nd quarters of 2002 respectively. The 2001 report target date is May 2002. Al Darlington will review the recent NERC DAWG reports and will report to the WG at the May meeting. Peter McLaren joined the working group.

B9: PSRC Web Site

Chair: Bill Lowe

Many new ideas were discussed for enhancing the web site. Some of these included archiving the older minutes of the Main and Subcommittee on a separate page, a page listing the past PSRC Chairs, a link for meeting registration, and a photo journal from each meeting. The attendees of the next meeting are encouraged to bring ideas to share, such as software reviews, demo web pages, etc. to the next meeting.

C: System Protection Subcommittee

Chair: D. Novosel

Vice Chair: T. Seegers

C2: Power Quality Issues in Protective Relaying

Chair: T.W. Cease

Vice Chair: David Hart

At this meeting, Section 5 was discussed and comments will be incorporated. At the next meeting, there will be a discussion of the first completed draft. Comments on drafts are due by April 1. Revisions are due by April 15, 2002. WG plans to complete the first draft by the next meeting in May.

C3: New Technology for Transmission and Distribution Protection

Chair: A. P. Apostolov

Vice Chair: P. A. Solanics

Session planned for the next meeting. Topic: How to use XML in our field. Time slot to be determined.

C5: Deployment and Use of Disturbance Recorders

Chair: B. Jackson

Vice Chair: W.M. Strang

The Working Group is working on Draft 3 of the outline for a paper. Very few comments were received. A similar document, written by PSRC in 1995, "Fault, and Disturbance Data Requirement for Automated Computer Analysis," includes a number of topics of the present outline. It was requested that the WG review this document to determine if some of these topics are properly covered and if they need to be included in the new document. A presentation was made by Jim Ingleson on Power Swing Recorders used by the NYISO.

C6: Wide Area Protection and Emergency Control

Chair: M. Begovic

Vice Chair: D. Novosel

Daniel Karlsson gave an update on CIGRE 38.02.19 activities in wide area protection. Daniel is a convener of the CIGRE WG on System Protection Schemes in Power Networks. WG agreed that there are no major changes required in the document.

Following actions were initiated:

- Draft 6.2 to be sent to people with actions by January 11 in MS Word 97 and pdf.
- Final contributions to be sent to Miroslav by February 28th
- Charlie Henville will merge part on out-of-step relaying from Chapter on Angular Stability Techniques to a section on out-of-step relaying.
- Daniel Karlsson will proof read the document. By March 20th
- Miroslav will send for consensus balloting in the WG by April 1st
- Final comments/ballots by May 1st
- Address comments and ballots at the meeting in May
- Balloting process to start by September

The report will be posted on the WEB.

It is also proposed that C SC starts a new WG to publish a conference paper to assure distribution and address if there is interest in additional activities in this area. 7 people already volunteered for this task.

C8: Phasor-Based Models for Analyzing Relay Performance

Chair: Mike Meisinger

Vice Chair: M. S. Sachdev

Juergen Holbach provided a draft on zero sequence compensation; this section will be incorporated in the paper before the next meeting of the Working Group.

Draft of Section III.B.3, "Model Implementation," continues to be outstanding; this section was reassigned to M. Sachdev. Bob Ryan was assigned Section III.C, "Phasor-Based Software Model Examples." After a prolonged discussion, this section was reassigned to Elmo Price, Gabriel Benmouyal, and Alex Apostolov. These sections are due before March 15, 2002. Vice Chair will incorporate these sections and will circulate the revised draft of the paper before the next meeting.

C9: Underfrequency Load Shedding and Restoration

Chair: A. Apostolov

Vice-Chair: K. Behrendt

The working group reviewed the guide's outline and review commitments for writing assignments. A few writing assignments were received, but several are still needed. The chairman discussed a new schedule get a draft document created. All outstanding writing assignments should be submitted by the middle of March, so the first complete draft document can be assembled and circulated in April for comments and possible Working Group ballot at the May, 2002, meeting. A comment spreadsheet will be sent out to working group members with the draft to permit comments on the draft in a standard format. Contributors are requested to select a section of the document to review, preferably a section that they did not write.

Al Darlington will create or edit drawings for the guide. Al will also contribute documentation for section 5 based on load shedding schemes used in Florida. Al requested that data plots to be included in the document should be accompanied by an Excel file with the original data points.

References will be grouped and numbered in the Bibliography section of the document.

The guide will include web addresses for links to other sources of under frequency load shedding documentation.

The scheduled completion date of December 2001 is not going to happen. Perhaps, December 2002 may be a more achievable completion date.

C10: Effects on Changing Utility Environment on Protective Relaying

Chair: J. DeLa Re

Vice-Chair: R. Hunt

The Chairman distributed copies of the last meeting minutes. Discussion focused on lack of survey results from previous meeting. Members were unaware of receiving the survey. Survey will be re-sent to all PSRC members, with a requested response date of March 31, 2002. Specific Working Group members provided discussions on changes from their individual experiences, and will forward written versions to the Working Group by March 31, 2002.

Assignments and Action Items:

- Chair to distribute survey to PSRC members by January 19, 2002.
- Survey results due by March 31, 2002.
- Vahid Madani, Tom Domin, Don Ware, Mark Carpenter, and David Emigh to provide write-ups on their experiences by March 31st, 2002.
- Chair and Vice-Chair to distribute survey results to Working Group prior to next meeting.

C11: Protection Issues During System Restoration

Chair: T. Sidhu

Vice-Chair: D. Tziouvaras

Three new write-ups on slack start issues, planning studies and issues related to natural disasters were received and briefly discussed at the meeting. Outline of the report was discussed and a few new issues that should be included in the report were identified. A number of assignments to revise previously received write-ups and new write-ups were made. The assignments are due by the end of February 2002. The chairman will write the introduction section and organize the report. This report will be sent to the members of WG for discussions at the May meeting.

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

Gary Michael: Nothing to report.

NERC Liaison Report to SC

Phil Winston: Nothing major to report.

D: Line Protection Subcommittee

Chair: M. Carpenter

Vice Chair: R. Hedding

The Line Protection Subcommittee met Wednesday afternoon, January 9, 2002 in Dana Point, CA with 20 members and 29 guests. Steve Conrad motioned to approve the minutes from the previous meeting, seconded by John Zipp.

D1: EFFECTIVENESS OF DISTRIBUTION PROTECTION

Chair, P. Carroll

Vice Chair, C. Fink

After introductions and approval of the September 2001 meeting minutes, the WG Chairman informed the group that a draft version of our survey report is now complete. The report was distributed. The group discussed issues such as percentage responses to questions and analysis of trends. The consensus is that we should not try to draw any conclusions and just let the survey responses stand for themselves. Volunteers were solicited to review and update the draft report to ensure format consistency. Rick Taylor, Skip Williams, and Patrick Carroll volunteered for this assignment. Rick Taylor will also do a presentation on the survey at the upcoming Texas A&M Protective Relaying Conference in an effort to publicize the survey and PSRC activities. The meeting concluded with a presentation by John Boyle on "How not to design a distribution system." John shared photographs and his experiences while in Nigeria to evaluate possible locations for the installation of 1.5 MW generators. Thanks to John for his presentation.

D2: FAULT LOCATING

Chair, Karl Zimmerman

Vice Chair, Damir Novosel

Working Group D-2 did not meet; however, Draft 6 is complete and ready to be sent to IEEE by January 15 for non-technical edits and to be posted on their ftp site. The chair is working with the Standards Coordinator to ensure the guide meets the most updated IEEE requirements. Once the balloting body has been created, we will ballot the guide.

We plan to meet in Pittsburgh to discuss balloting results and any further activities, like writing a summary paper that could be presented at future conferences. .

D3: IMPACT OF DISTRIBUTED RESOURCES ON DISTRIBUTION RELAY PROTECTION

Chair, Tony Seegers

Vice Chair, Ken Birt

This working group is to write a paper to the subcommittee. This may later be revised for submission as a transaction paper.

An outline was distributed for discussion. Obsolete standard ANSI/IEEE 1001-1988 was also distributed for reference. Some changes were suggested for the outline. The focus will be on distribution relaying, but the effects on the transmission/subtransmission system will also be mentioned.

Writing assignments were made for the portions of the outline. Assignments should be returned to Tony Seegers by March 15, 2002.

Ljubomir Kojovic gave a presentation on a test model using EMTP and MATLAB to show distributed generation on a feeder.

D4: AUTOMATIC RECLOSING

Chair, W.M. Strang

Vice Chair, Mal Swanson

Mal Swanson chaired the meeting of this WG. The Guide's negative ballots have been resolved.

It was decided to promote the guide to the regional conferences in 2003. The specific tasks to be performed are:

1. Generate a Power Point presentation Barry Jackson and Charlie Sufana
2. Write a summary paper by May 2002. Bill Strang
3. Write an abstract and selling document. Jim Ingleson
4. Coordinate Guide publication. Bill Strang
5. Obtain approval to present guide at specific conferences. Swanson, Strang, et al
6. Sell copies at conferences. Bill Strang/ presenters

D10: EMTP REFERENCE MODELS FOR TRANSMISSION LINE RELAY TESTING

Chair, K. Mustaphi

Vice Chair, T. Sidhu

Draft 3 of the report was discussed. It was agreed to simulate the basic system model using different EMTP packages to identify data requirements. Elmo Price will modify one-line diagram of the basic system model. John Zipp will revise case file nomenclature file section of the report. Section 10 of the report on test cases was discussed. A number of revisions were suggested and will be incorporated in the next draft. It was agreed to add a section on "Usage of Simulators." The working group will discuss the output of the WG and expected completion date at the May meeting.

DTF1: IEEE Guide for Protective Relay Applications to Distribution Lines

Moderator: Phil Waudby

The task force discussed the proposed scope and began the formation of a document outline. The scope for the PAR currently reads:

"This guide will cover the application and coordination of protection for radial power system distribution lines. Describe the fundamentals, line configurations, and schemes. Identify problems and describe solutions associated with various methods employed in distribution line protection."

The task force decided to complete the outline prior to finalizing the scope. The task force members were asked to submit changes to the outline by the end of January 2002. M. Sachdev will issue a standard number. This will be designated as Working Group D5 Distribution Line Guide.

New Business

A new task force on Out of Step applications to Transmission lines is being formed and will meet at the May PSRC meeting. Mike McDonald will lead this effort. At least 11 people showed interest after polling subcommittee. Additional members will be welcomed.

High Impedance Fault Activity -

Steve Conrad mentioned one instance involving a gravel truck that pulled two conductors down. Conductors welded themselves together and made lots of glass from the sand. No relay or fuse operations.

H: RELAY COMMUNICATIONS SUBCOMMITTEE

Chair, M. S. Simon

Vice Chair, K. J. Fodero

H1: REVISION OF IEEE GUIDE FOR POWER LINE CARRIER APPLICATIONS

Chair, B. Nelson

Vice Chair, M. Simon

H1 has completed its assignment in authoring clauses 9 and 10 for P643. Consensus by the working group has been reached.

When the balloting process is complete on P643 by the IEEE, the working group will re-convene to resolve any comments regarding these clauses as well as verify that there is no duplication with other elements of the guide.

H2: PROTECTION USING SPREAD SPECTRUM COMMUNICATIONS

Chair, Ken Behrendt

Vice Chair, Bill Lowe

An excellent presentation was made by Duane Buddrius of Alvion USA, entitled "Protection using Spread Spectrum Communications." We will attempt to make this presentation available on the H2 work group web site.

We still need volunteers for the writing assignments and all members and perspective members are encouraged to volunteer for a portion of the outline.

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

Draft 5 of C37.115 completed successfully the first ballot. The ballot pool consists of 60 eligible voters. This ballot received 52 votes (83%), and has met the 75% returned ballot requirement. 46 affirmative and 3 negative votes (93%) were received, and PC37.115 has met the 75% affirmation requirement.

A Ballot Resolution Committee (BRC) has been formed to resolve all comments received. All persons who submitted negative comments are members of the BRC. The following persons agreed to be members of the Ballot Resolution Committee:

- Bob Dempsey
- Ken Fodero
- Dennis Holstein
- Dan Nordell (and liaison to SCC36)
- John Tengdin
- Eric Udren
- Murty Yalla

Douglas Dawson suggested that the title be changed from “Standard test method for the evaluation of message communications between...” to “Standard evaluation method for message communications between....” Members and guests present agreed that the change should be made. Dennis Holstein will check with the IEEE SA staff to determine if this is classed as an editorial change, and therefore can be made without recirculation to rebalot the change.

The members and guest debated at length the merit of changing the specification from a Standard to a Guide. This change would basically resolve the current negative ballots. The concern is whether such a change will require that this document and PAR be withdrawn, and a new PAR be requested. If this is required, then it would take at least 2 years make the changes to the document, form a new balloting body, and rebalot the new draft.

If the changes are not made, H4 may have to live with 3 unresolved ballots. With 93% affirmative, H4’s BRC should be able to make all the editorial changes, recirculate and ballot those clauses that have technical changes, and subsequently prepare the final draft for submittal to RevCom by the end of 2002.

H5: Application of Substation Peer to Peer Communications

Chair, M. Yalla

Vice Chair, M. Adamiak

H5 has completed their assignment there will be no further reports.

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

Chair, John Burger

Vice Chair, Charlie Sufana

The agenda of minutes were distributed. The past minutes were reviewed, discussed, and approved.

A guest, Kay Clinard, talked about IEC 61850 7.1, .2, .3, .4, and .5 which were out for approval. GOMSFE was discussed and it was noted changes were made. It is on the SISCO website and new version .98 is to be out shortly. GOMSFE 1.0 will eventually be issued and will be equal to what appears in 61850.

I presented a number of overheads on AEP's MMT control screens. I noted AEP is buying primarily VCA related protection products and have a bias toward these products. We discussed hubs and noted switches have replaced HUB's in the LAN architecture. AEP is using D6 powered switches and using mostly fiber for communications.

The working group next reviewed writing assignments including a table of contents and some new chapters that may need to be added.

Mark Adamiak discussed a configuration language for relays that may need to be added. XML will be used by most all manufacturers and will be the standard way to describe all relays including settings.

Other writing assignments received were noted briefly and were asked to be reviewed by the members.

New writing assignments were identified and are due 3/1.

The first draft of H6 WG will be ready for review in May.

H7: PC37.94 INTER RELAY COMMUNICATION PROTOCOL STANDARD

Chair, G. Michel

Vice Chair, TBD

The group met, reviewed, and approved power point presentation for the main committee meeting on Thursday 1-10-02.

C37.94 has balloted and all ballot issues should be resolved by the end of January. The proposed standard will then be forwarded to Rev Com for approval.

H8: FILE NAMING CONVENTION FOR TIME SEQUENCE DATA

Chair, Jim Ingleson

Vice Chair, Mark Taylor

H8 has completed their assignment there will be no further reports.

H9: Special Considerations in Applying PLC for Protective Relaying

Chair, M. Sanders

Vice Chair, M. McDonald

Draft 6a of the special paper was distributed. The draft was reviewed and several topics were assigned to be expanded as well as additional assignments for the existing topics. The writing assignments are due to the chair by April 22, 2002.

The chair will forward draft 7 electronically to the members.

We are expecting to be able to complete this by the end of 2002 if the transformer testing by John Zipp takes place as scheduled. The information that will be gathered from this testing will be very vital to the success of the paper.

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

Chair, Bill Higinbotham

Vice Chair, Jerry Hohn

Draft 5 was reviewed and numerous revisions were made. New work assignments were made. All assignments are due in by March 1st. The assignments are as follows:

R. Ray – Revise sections 4.1.1, 4.1.2, and 4.1.3

J. Gilbert – Revise sections 4.3.1, 4.3.2, and 4.3.3

T. Phillipe – Write section 6.1.3.5 on DCUB

S. Ward – Write section 6.1.3.7 on audio tone current differential relaying

W. Higinbotham – Write section 4.2.6 on advanced modulation schemes, revise annex C to show proper math, change the word “telephone” to “voice grade channel” where appropriate.

The existing draft 5 will be sent to the IEEE editors for their review.

A new draft will be generated by April 1st. This draft will be circulated prior to the next meeting. At the next meeting we will attempt to get working group consensus that it is time to proceed to ballot.

H11: REVISION TO THE SYNCROPHASOR STANDARD

Chair, K. Martin

Vice Chair, TBD

Draft 2.3a was distributed. Members made presentations on processing delays, filtering, and algorithms. The phasor representation at nominal and off-nominal frequency was discussed in detail. Several members were asked to draft and circulate a revised section on phasor representation including the reference point for the phase angle and time tag.

The discussion continued on the details of the message format. The section on “Sources of Synchronization” will be reviewed and condensed as necessary.

Task Force Reports

HTF1: SWITCHYARD DATA ACQUISITION

Chair, E. Udren

Did not meet. At a previous meeting, the TF had reviewed technical features of IEC 61850-9-1 on serial point-to-point link for process data, based on a dedicated Ethernet LAN. One vendor informed the Chairman that this link will be demonstrated at the UCA demo on Thursday evening January 9, following the PSRC meeting. An update on 61850-9-2, process bus object definition within the substation control. Architecture should be available for the May PSRC meeting, following the March meeting of IEC TC57 WG 12.

Liaison Reports

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

PSCC Chairman John Newbury has assured the Liaison that minutes will be forthcoming within weeks. In the meanwhile, this is the information that is available:

The Carrier Application Guide, reported as it progressed for several years, should be published by next year at this time.

The Fiber Optic Communications SC is working on a tutorial on using different types of fiber.

The New Concepts and Protocols SCs have merged and are forming a WG for a new protocols tutorial.

The Radio SC held a highly successful tutorial at the Summer Power Meeting on mobile radio applications. They plan to enhance and repeat this.

2. Substation Committee - J. Tengdin

In December 2001, the IEEE SA Standards Board approved the reaffirmation of C37.2 – 1996 Std Electrical Power System Device Function Numbers and Contact Designations. In the electronic balloting, there were no negative ballots. There were hitches in the electronic balloting process, and a “Lessons Learned” report has been forwarded to the Standards Coordinators of the Substations Committee and PSRC.

Work continues to resolve negative ballots on P1525, with re-balloting to take place in 2002.

Work also continues on updating the SCADA standard. C37.1, to reflect the prevalent use of relays and other IEDs as data sources for SCADA.

At the Winter Power Meeting in New York later this month, work is expected to begin on a new standard to document substation configuration details. The proposed standard will address the connectivity of the power system devices, the connectivity of the IEDs to power system devices, and the connectivity of the IEDs to the communication system in a LAN environment (including hubs, switches, routers, protocol converters, gateways, and firewalls.

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

Nothing reported at this meeting.

I: RELAYING PRACTICES SUBCOMMITTEE

Chair: Jeff Gilbert

Vice Chair: J. W. Ingleson

The minutes of the previous meeting were approved with one correction.

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

Chair: W. J. Marsh, Jr.

Vice-Chair: J. D. Huddleston, III

Comments on Draft 11 should be sent to the Chairman. A one-year extension has been requested.

I2: Terminology Usage Review

Chair: M. J. Swanson

Vice-Chair: J.D. Huddleston, III

At the January 2002 meeting of the WG, discussion of when the WG should begin review of the definitions in each new PSRC Guide or Standard showed that the WG should revert to its original scope, and do the reviews after each document is balloted. The outputs of this WG are lists of definitions, which are submitted for inclusion in IEEE Standard C37.100, the switchgear standard definitions, and IEEE Standard 100, the standard

dictionary. Mr. Swanson will collect copies of recently balloted PSRC documents and will circulate them to the I2 Members for review.

14: IEC Standards Advisory

Chair: E. A. Udren

Vice-Chair: M. M. Ranieri

The WG appreciates the efforts of WG member Veselin Skendzic in running the September meeting in Madison. The topic for that meeting was the draft 95/127/CD - Overall EMC Requirements for Measuring Relays and Protective Equipment. This gives a summary of all the specific EMC tests to be required for relays, to meet EC legal requirements. Comments by one of Eric's staff engineers on these test levels were provided. Comments were submitted to USNC for transmission to IEC, based on test levels with which we do not agree.

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

Chair: E. A. Udren

Vice-Chair: P. G. McLaren

The Chairman thanks WG member Veselin Skendzic for running the September meeting in Madison, where a revised draft of the WG paper was distributed and reviewed, and guests were filled in on details of the overall project. In November, we applied for a PAR extension to the end of 2002 to provide time for balloting; the extension was granted in December. The draft Standard C37.92 is to be resubmitted for the electronic balloting process according to instructions just received. The WG did not meet at the Dana Point meeting in January 2002.

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

Chair: M.M. Ranieri

Vice-Chair: J. Teague

The WG met to discuss the current draft and the dielectric requirement for relay circuits rated 50 volts or less. A concern was raised as to the applicability of the current dielectric voltage requirement for Ethernet connections to relays but no agreement reached for a proposed value. Our current requirement harmonizes with IEC 60255-5. There were also other editorial changes that will be incorporated into our final draft prior to submission. The PAR status was discussed and the WG chairman will work with our coordinator to resolve the PAR issue and to request the formation of a balloting body.

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

Chair: J. Teague

Vice-Chair: J.T. Tengdin

IEEE Std C37.90.3 was published by IEEE-SA in October 2001. The WG is now preparing an IEEE summary paper describing the new standard. The paper will explain the differences between IEEE C37.90.3-2001 and the relevant IEC standards, and the reasons for the differences. Completion of the summary paper is expected in March 2002.

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

Chair: J.G. Gilbert

Vice-Chair: J. Teague

The WG met last on 9/18/01. The ballot of PC37.90.1 received 100% approval. A draft summary paper was reviewed at that time. The Chairman will make revisions and send the revised document to the working group. The WG did not meet in January 2002.

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

The basic write-up is complete. Several editorial changes were discussed. It was decided that after making the proposed editorial changes, the write-up would be forwarded to the IEEE editorial board for final PDF formatting prior to electronic balloting.

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

Chair: D.M. Clark

Vice-Chair: M. Bajpai

The WG has an OCR'd copy of their document and is in the process of correcting the OCR errors. Chapter responsibilities have been assigned. Some comments have been entered into the document. The group did not meet at the January 2002 PSRC meeting.

I11: Survey of Relay Test Practices

Chair: E. Krizauskas

Vice-Chair: W.G. Lowe

The final draft of the report was submitted to the co-authors on Jan 2, 2002 for their review and comment. Comments were requested to be issued to the chairman by Jan. 15. Comments will be assimilated into the document, and the document will be forwarded to the Relaying Practices Subcommittee and the PSRC officers by Feb. 1. There was no meeting of the WG at the January 2002 PSRC meeting. The WG expects to present the report at the 2002 Summer meeting.

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

Chair: M. Meisinger

Vice-Chair: D.R. Sevcik

Draft #1 of the revised guide is being developed. The revised guide content will be coordinated with C37.110 and C37.103. It is anticipated that the revised guide will address low energy current sensors. An extension of the PAR to 2004 is being investigated.

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

Chair: M.S. Sachdev

Vice-Chair: B. Mugalian

The drawings for the guide were reviewed and minor changes were proposed. Al Darlington will revise the drawings and forward them to Brian Mugalian who will prepare the next draft using the IEEE template and will distribute it to the working group members by February 15. John Appleyard and Martin Best joined the WG.

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

Chair: T.A. Phillippe

Vice-Chair: R. Young

The series of educational seminars continued with a very informative presentation by Mark Adamiak of the fundamentals of Ethernet. Mark will continue his presentation at the next WG meeting in May 2002 in Pittsburgh, expanding into TCP/IP and wide area

networks. Previous topics covered were TDM and fiber optics. Additional subject matter of interest is being sought.

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

The WG discussed including a "CT Saturation Calculator" program with the guide. The WG recommended that this Excel spreadsheet program be made available on the PSRC Web site. A reference, including a background theory description of the program, will be added to the Annex of the guide. The WG members will be receiving copies of Draft 3 of the guide in April 2002. Members have been asked to provide comments for the May 2002 meeting.

I16: Understanding Microprocessor-Based Technology Applied to Relaying

Chair: M.S. Sachdev

Vice-Chair: R. Das

The minutes of the May 2001 meeting held in Vancouver, B.C., were approved as circulated by e-mail and posted on the web site. The status of the outstanding contributions was reviewed and the members were reminded to submit them before February 15. A group of six was selected to work on editing the document. This will be done between meetings via e-mail.

I17: Trends in Relay Performance

Chair: W.M. Carpenter

Vice-Chair: J.D. Wardlow

Results and presentation format for the 2000 relay performance information was presented. Preliminary 2001 system relay performance results were presented by five different companies. Prior to the May meeting, the performance data will be gathered from additional companies and compiled. At the May meeting, the Working Group will review the information and begin writing the paper. The paper will be complete in January or May 2003.

I18: Harmonization of IEEE C37.90.2

Chair: J. Burnworth

Vice-Chair: W. Higinbotham

The WG has concluded to test over the frequency range of 80 MHz to 1 GHz. Test levels will be 35 V rms and will include a 1 kHz modulation. Draft #2 of the revised specification has been reviewed through Section 5.4. WG members were requested to complete their review of Draft #2 and comment to the Chairman by March 15, 2002.

I19: Analysis of Substation Data

Chair: L.E. Smith

Vice-Chair: B.A. Pickett

The WG met at the January PSRC meeting. The final draft of the paper was approved with minor changes. Discussions continued on availability of past papers and reports. The final report will be submitted for inclusion on the subcommittee web site. It was also suggested that the report be given at a main committee meeting sometime in the future. No further meetings of this WG are planned. The assignment has been completed.

Task Force Reports:

ITF1: Relay Service Letter Database

Chair: J.W. Ingleson

One new letter has been received since the previous meeting, covering a possible capacitor problem in the LCB/LCBII product line. This will be placed into the database. The database is available on the ITF1 area of the subcommittee web site.

ITF2: Relay Firmware Quality Assurance

Chair: J.A. Whatley

Vice-Chair: R. Beresh

The TF met at the January meeting. It was decided to proceed with a Recommended Practice. A title was selected for the future WG "Recommended Practice for Microprocessor-Based Relay Firmware Control." PAR purpose statement selected "Provide a Recommended Practice for the identification and dissemination of changes and information relating to microprocessor-based protection equipment firmware, between manufacturers and users." A draft PAR scope will be sent out to the members for comment and then a PAR will applied for. Homework assignment to examine software Verification and Validation documents in order to determine if parallels applications exist. Roger Whitteker of BPA has graciously accepted the role of secretary of this TF.

Liaison and Coordination Reports:

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

Transformers: J. D. Huddleston, III

Although the Transformers Committee met in Orlando in October 2001, the latest published Minutes are those for the April 9-12, 2001 meeting in Amsterdam. I received the hard copy of these Minutes, which are also published on the Transformers Committee web page.

Liaison from the Transformers Committee:

As I noted for the May meeting of the PSRC, both the C57.13 document and the C57.13.5 document were surveyed by the Instrument Transformers Subcommittee; those comments and changes are being incorporated into both documents.

C57.13.5/D14 "Draft of Trial-Use Guide of Test Requirements for Instrument

Transformers Rated 115-kV Nominal System Voltage and Above: After the survey by the Subcommittee, the WG. has decided to split into two directions: one, to finalize Draft 14 for the Trial Use Guide, and, two, to enhance the document to become a Standard.

This second direction will require a new WG, Chair, and PAR.

Coordination for WGPC57.13 (Revision of the C57.13 Standard): General Requirements for Instrument Transformers (Tom Nelson, Chair):

This WG met in Amsterdam and made these changes and comments: first, a partial discharge test as provided by Anthony Joniatti was added to clause 4.7.2; it was noted that all dimensions will be in SI units; and it was proposed that clause 8.8.2 be removed. Mr. Nelson noted that the measurement requirements are outdated and proposed that these be updated on the next revision. The Par was extended through December 31, 2002.

Coordination for WG PC57.13.6: Instrument Transformers for Use with Electronic Revenue Meters and Relays (Chris Ten-Haagen, Chair):

This working group did not meet in Amsterdam.

P420 IEEE Standard Design Class 1E Control Boards, Panels, and Racks Used in Nuclear Power Generating Stations **C.L. Downs**

Draft 2 of the revision of this standard has been adopted after completion of the balloting process, resolution of negative ballots and submission to the standards board. The standards board accepted the document in its September 2001 session. The standard has been posted for sale on the IEEE website.

Therefore, our subcommittee need no longer follow this subject in our session.

I had reviewed the document some time back, and found nothing that PSRC would object to in its content. This was reported to the subcommittee.

Cliff Downs

P384-NPEC, Standard Criteria for Independence of Class 1E Equipment and Circuits **M. Bajpai**

No report furnished at this meeting.

New Business: Mr. Gilbert has named Don Sevcik, Ratan Das, Bob Beresh, and Jim Whatley as Members of the Subcommittee.

J: ROTATING MACHINERY PROTECTION SUBCOMMITTEE

Chair: R.D. Pettigrew

Vice Chair: S. P. Conrad

Minutes of the September 2002 meeting in Madison, Wisconsin were approved as published on the PSRC Web site.

J1: REVISION OF C37.106-1987 GUIDE FOR ABNORMAL FREQUENCY PROTECTION FOR POWER GENERATING PLANTS

Chair: G. Benmouyal

Vice Chair: E. Fennel

Draft #12 of the document was produced after a ballot of consensus was taken within the WG and J-SC. One pending negative comment from R.W. Haas has to be resolved. Draft #12 has been sent to the IEEE Standards Department to proceed with the final ballot by the balloting body.

J3: PROTECTION OF SMALL INTERCONNECTED GENERATORS

Chair: E. Fennel

Vice Chair: R.V. Rebbapragada

The Main committee agreed to convert JTF1 into a working group J3.)

This is the first meeting of Working Group. Mr. R. Vittal Rebbapragada was selected to be the Vice Chairperson for the Working Group.

The working group reviewed the assignment as indicated above and agreed unanimously to proceed with the assignment.

The WG members identified several items that many felt should be key elements in this transaction paper. These items are the issues associated with generator protection elements coordinating with the power system protective devices, protection of the unit

during abnormal system conditions and tradeoff on the selection of protection functions. Additionally, the meeting participants agreed to initially limit the size/define small generation as being units 5 MVA or less. The WG agreed that it would consider increasing the size of unit as define in pervious sentence if warranted.

There were several assignment made at this meeting and are as follows:

- Review the latest version of the IEEE Buff Book ANSI/IEEE Std. 242 to identify relevant recommendation on this WG Assignment. Chuck Mozina
- Investigate industry practices for primary and backup protection of Micro-Turbines unit. Wayne Hartmann
- Contact Manufacturers of Micro-turbines, engines, steam units and combustion turbines to obtain their recommendation for the providing both primary and backup protection on their products. Matt Basler/Chuck Mozina
- Obtain previous ANSI/IEEE publication(s) on assignment. Murty Yalla

The above writing assignments are due to the Chairperson by April 1, 2002. If there are any questions, please contact the WG Chairman, Everett Fennell.

J4: REVISION OF C37.102 AC GENERATOR PROTECTION GUIDE

Chair: M. Yalla

Vice Chair: K. Stephan

The writing assignments received since the Madison, WI meeting were reviewed. The clause on field ground protection was improved to emphasize that no generator should be operated for an extended period with a field ground present. Clause 4.5.7 was revised to include more information on combustion turbines and underfrequency protection.

The WG discussed adding more actual settings examples to the guide. Writing assignments were made and for most of the protective functions used on AC generators. The settings examples will probably be an annex to the PC37.102 guide.

Expect to produce Draft #1 by the September 2002 WG meeting.

J5: GENERATOR PROTECTION CRITERIA

Chair: C.J. Mozina

Vice Chair: M. Reichard

The WG assignment is to develop an IEEE Transaction paper to assist the industry in better coordinating generator protection with generator control. The paper will also consider impact of stability limits and generator capability in the development of generator settings. The major portion the meeting was spent reviewing proposed draft outline for the paper. The following assignments were made:

- Waudby and Uchiyama – provide the chairman with NERC requirements relating to coordinating generator protection and control.
- Zeeky and Korbert – review papers on the subject provided by Brad Nelson and summarize for consideration of relative material for the WG paper.

- Waudby – provide test sheet and system data for a large unit connected generator to be used in the example calculations in the paper. Data will include maximum and minimum excitation limiter AVR settings.

Based on the above information, Chairman Chuck Mozina will develop a paper outline suitable for marking writing assignments. Mike Reichard accepted the vice chair position.

J6: PERFORMANCE OF GENERATOR PROTECTION DURING ABNORMAL FREQUENCY DISTURBANCES

Chair: S. Patel

Vice Chair: K. Stephan

The changes made to draft #4 were briefly discussed. The WG discussed comments from Terry Crawley. Some of the comments were concerns about significance of the J6 paper in relation to NERC requirements for generator protection. Expressing specific relay settings in this paper may suggest they become requirements in NERC or similar documents. Terry also submitted several clarifications to the paper, which were reviewed at this session.

The paper has been sent WG and SC members for comments of substance. After receipt of the comments, the paper will be readied for publication.

J7: REVISION OF C37.101 GENERATOR GROUND PROTECTION GUIDE

Chair: J.T. Uchiyama

Vice Chair: R. Das

The chair opened the meeting and distributed copies of the last meeting minutes (May 2001), and documents to review at this meeting.

New clauses (Hybrid generator ground, Directional ground fault protection for bussed multiple grounded generators, grounding transformer taps, and third harmonic calculations) were reviewed.

Draft # 1 is to be produced for the May meeting. Assignments are due March 15, 2002 and should be sent to the chair.

Liaison Reports

1. Electric Machinery Committee, C.J. Mozina

No report provide, should be available shortly.

Coordination Reports

1. P958-EDPG, Guide for Adjustable Speed Drives, J. Gardell

No Report

2. P408-NPEC, Standard Criteria for Class 1E Power Systems for Nuclear Power Generating Stations, K.J. Khunkhun

No report given. R.V. Rebbapragada volunteered to report in the future.

3. P1010, Guide for Control of Hydroelectric Power Plants, Wayne Hartmann

No report, this group meets at the PES-WPM.

K: SUBSTATION PROTECTION SUBCOMMITTEE

Chair: S. R. Chano

Vice Chair: C. R. Sufana

The minutes of the previous meeting in Madison, WI were approved without modification.

K2: BREAKER FAILURE PROTECTION

Chair: R.A. Hedding

Vice Chair: A. Chaudhary

The expanded outline which was last meeting's writing assignment was reviewed and revised. The writing assignments on the introduction and "Back up Protection" were also reviewed. A new writing assignment was given to take the expanded outline and expand to sections of the guide was given. The new assignments are due February 14th.

K4: BUS PROTECTION GUIDE

Chair: S. P. Conrad

Vice Chair: R. W. Haas

The chairman has contacted the PSRC Standards Coordinator to determine the action required to transmit the draft to the Standards Board. The chair will reformat the draft into a pdf file and send it to the SA for the establishment of a balloting body.

The WG discussed whether to write a summary paper. It was felt that this is not required.

K5: NETWORK TRANSFORMER PROTECTION GUIDE

Chair: C. R. Sufana

Vice Chair: A. P. Napikoski

Draft 11 will be voted on at the March 20, 2002 RevCom meeting as it passed the recirculation ballot from September 2001. There were a few minor changes requested, so C. Sufana has produced Draft 12. Both Draft 11 and Draft 12 are being presented to RevCom and both have been converted to pdf format.

There was some discussion on P1547. Steve Conrad reported that there is a meeting coming up at the end of the month. He indicated that there may be some compromising on the wording for network protectors to only refer to newer type of protectors. He indicated that the P1547 group may be done very shortly.

The working group next reviewed the existing summary paper. Writing assignments were assigned with everyone to return their write-ups by February 15, 2002.

The WG will meet in single session for 10 people and will need no A/V.

K6: SHUNT CAPACITOR PROTECTION GUIDE Tutorial

Chair: Pratap A. Mysore

Vice Chair: Roger Hedding

The WG chairman updated the group on the presentations at MIPSYCON held in November 2001. The WG Chair would like to thank the Subcommittee Chair, Simon Chano, for his efforts in making the guides available for sale at MIPSYCON.

The next presentation will be a four hour tutorial on application and protection of shunt capacitor banks at Texas A&M on April 18, 2002. This will be a joint effort with the Capacitor T&D Committee. Dr. Glenn Swift has agreed to assist the working group in reviewing the tutorial materials.

Organizers of other conferences such as Electric Council of NE, Western Power, have been contacted for future presentations.

The WG also reviewed the slides for presentation at the Main Committee.

K7: GUIDE FOR THE PROTECTION OF SHUNT REACTORS.

Chair: K. A. Stephan

Vice Chair: P. G. Mysore

Draft 4 of the guide was distributed and the changes from draft 3 were reviewed. We discussed some reactor designs with auxiliary power windings are susceptible to damage if the auxiliary winding is open-circuited (similar to opening a ct secondary).

Non-controlled interrupting devices such as current-limiting fuses can be used to avoid inadvertent opening of the circuit. Since this is not a protective relaying issue, this information was placed in a footnote in the guide (which is not officially a part of the standard).

The working group considers this publication nearly complete. The Standards Coordinator will supply contact information to send this guide to the IEEE Editor to verify conformance with the IEEE Style Guide. The guide will also be sent to the coordinating committees specified on the PAR. The process of forming a balloting body will follow.

K8: GUIDE FOR PROTECTIVE RELAYING OF UTILITY CONSUMER INTERFACE

Chair: Irwin Hasenwinkle

Vice Chair: Fred Griffin

Irwin Hasenwinkle reported that the IEEE HQ wanted to see draft 7. The PAR expires in September 2002. It may have to be recirculated again.

K10: (Ex KTF1): SCC21 Distributed Resources Standard Coordination

Chair: William Feero

Vice Chair: Doug Dawson

Vice chair, Doug Dawson chaired the meeting because the chair was unable to attend.

The working group reviewed the latest proposal from SCC21 for P1547 clause 4.1.4, Distributed Resources on Distributed Resources on Distribution Secondary Grid and Spot Networks.

A number of comments about the section were made. Most of these were about the need to clarify the intent of the wording, but several members expressed concern about the need to support numerical thresholds used in the proposed standard.

The vice chair will assemble these comments and send them to the chair for consideration at the next SCC21 meeting, in January 2002.

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

Chair: F. P. Plumptre

Vice Chair: Dan Hamai

The WG chair, Frank Plumtre announced that Dan Hamai has agreed to be the new vice chair.

Written contributions for subsynchronous transients, redundancy, fiber optic signal transmission, MOV protection, and capacitor unbalanced protection examples were discussed in detail by the working group. These contributions will be incorporated into Draft 3.0.

Additional writing assignments were made for the outstanding sections.

Liaison Reports:

All liaison reports will be available after the January 2002 meeting.

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

Liaison from the Transformers Committee:

The Transformer Committee met in Orlando, FL, in October 2001. The latest published minutes are those from the April 9-12, 2001 meeting that was held in Amsterdam; these minutes are also available on the Transformers Committee website. The Committee has stopped all work on ANSI C57 standards that are copyrighted by NEMA. All other committee business is progressing normally.

Coordination Reports:

All coordination reports will be available after the January 2002 meeting.

1. ANSI/IEEE Switchgear Standards F. Plumtre.

a) ANSI/IEEE Standard C37.20.3 Standard for Metal-Enclosed Interrupter Switchgear.

Nothing is reported at this time. Paul Drum thinks there may be a balloting body being formed.

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

Nothing is reported at this time

2. Transformer Committee, Project C57.119, Recommended Practice for Performing Temperature Tests on Oil Immersed Power Transformers at Loads Beyond Nameplate Rating. J.E. Stephens

All balloting was completed and it was on the agenda for 9/12/2001 IEEE RevCom meeting. It was approved and is now being printed for publication. We can now close out the coordination for C57.119.

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

No additional news.

4. C37.66 Requirements for Capacitor Switches for AC Systems, S R Chano.

Finished

5. P1375 Guide for the Protection of Large Stationary Battery Systems, T. E. Weidman

Need a new volunteer; Steve Conrad will try to do it.

6. P1538 (When approved) Guide for Determination of Maximum Winding Temperature Rise in Liquid Filled Transformers, Dan Hollands

Dan Hollands was not present

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

Nothing to report. Steve Conrad is having trouble getting data; he will check the websites.

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

Nothing to report. Steve Conrad is having trouble getting data; he will check the websites.

9. 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.

Nothing to report. (Only 1 year old)

10. ANSI/IEEE Switchgear Standards, Vittal Rebbapragada

- a) **PC37.30.01 Standard Requirements for High Voltage Air Switches, Switching Devices, and Interrupters.**
- b) **PC37.100.1 IEEE Standard of Common Requirements for Power Switchgear**

No report is available at this time

11. PC37.1 Standard for Metal Enclosed Low Voltage Power Circuit Breakers, Irwin Hasenwinkle

Irwin reports that the last time he heard they were in the balloting process but he hasn't heard anything new.

Old Business

KTF3: SCHEMES AND MEASURES THAT CAN BE ADOPTED TO PREVENT AND/OR REDUCE OUTAGE DURATIONS FOR SUBSTATION FAULTS TASK FORCE will meet to discuss reducing outage time. The TF will report to the Sub Committee in May. Tarlatan Sidhu and Bruce Pickett have each submitted proposals. Both discussed the same topic so they are looking to combine efforts.

New Business

Simon Chano asked if there were any new working groups to be proposed. There were none to be proposed.

Chairman Chano then asked if there were any horror stories or items of interest: Steve Conrad asked if anyone has interconnected photovoltaics connected via Xantrax (Trace) interfaces has been disallowed by UL. Apparently, if the line were lost, they would keep commuting. His utility is going to disconnect those customers. They have 7 customers.

Jim Stephens has retired and will not be coming to the PSRC. Simon Chano thanked him for his work, although he was not present. Doug Dawson asked if a certificate of appreciation could be sent to Jim Stephens.

Ahmed Elneweihi was thanked for his contribution to the Subcommittee since he will not be attending the PSRC because of his job change.

Arvind Chaudhary was welcomed as a new member of the K subcommittee.

Attachment

**January 2002 PSRC
Attendance**

J.C. Appleyard	C. L. Downs	P. Kumar	R. V. Rebbapragada
R. Bailey	P. R. Drum	S. Kunsman	G. Rosselli
M. Basler	W. A. Elmore	K. Kuras	M.S. Sachdev
M.G. Adamiak	D. Emigh	T.C. Lanigan	M. P. Sanders
M.E. Agudo	E.C. Fennell	L.P. Lawhead	R.W. Seitz
A.P. Apostolov	C. Fink	T.M. Lebakken	D.R. Sevcik
K. Behrendt	K. Fodero	W.G. Lowe	H. Shuh
R. Beltran	R. Fuchs	V. Madani	T. Sidhu
G. Benmouyal	V.A. Gharpure	K. Martin	M.S. Simon
R. Beresh	J.G. Gilbert	S. Mazumdar	V. Skendzic
M. Best	H. Gilleland	W.P. McCannon	L.E. Smith
K.A. Birt	A.T. Giuliante	J.D. McDonald	K.A. Stephan
K. Boers	E. Guro	M.J. McDonald	C.R. Sufana
J.R. Boyle	D. Hamai	P.G. McLaren	M. Swanson
B. Brobak	R. Hamilton	H.I. Mehta	G. Swift
G.A. Brunello	D. Hart	M. Meisinger	R.P. Taylor
Z.A. Bukhala	W.G. Hartmann	L.M. Messing	E.A. Taylor
J.F. Burger	I.O. Hasenwinkle	D.H. Miller	J.T. Tengdin
J. Burnworth	R. A. Hedding	G.P. Moskos	S.I. Thompson
W.M. Carpenter	C.F. Henville	C.J. Mozina	M. Toupin
P. Carroll	W. Higinbotham	B. Mugalian	D.A. Tziouvaras
C.H. Castro	K. Hill	P.G. Mysore	J.T. Uchiyama
T.W. Cease	J. Hirning	G.R. Nail	E.A. Udren
S.R. Chano	C. Hoga	A.P. Napikoski	S.M. Usman
AKS Chaudhary	J. Holbach	K. Narendra	B.A. Vandiver
G. Chirco	D. Holstein	M. Nemier	L. Wang
K. Clinard	J.J. Horak	J. Newbury	S. Ward
F. Cobelo	J.D. Huddleston III	D. Nordell	J.D. Wardlow
S.P. Conrad	R. Hunt	D.J. Novosel	D.K. Ware
W. Cook	C.R. Huntley	J.M. Obrian	W.P. Waudby
R. Copernoll	J.W. Ingleson	S.C. Patel	D. Weers
J.R. Cornelison	B. Jackson	R.W. Patterson	C.G. Wester
R. Crellin	G. Jang	P. Patton	R.M. Westfall
A.N. Darlington	G.F. Johnson	R. D. Pettigrew	R.L. Whittaker
D.C. Dawson	L. Johnson	A.G. Phadke	J. B. Williams
D. Dayton	D. Karlsson	T.A. Phillippe	P.B. Winston
J. De La Ree	P. Kerrigan	F.P. Plumptre	M. Yalla
R.W. Dempsey	M. Kezunovic	E. Price	R. Young
B. Dickerson	S. Kim	D. Radcliff	K. Zimmerman
H. DoCarmo	G.L. Kobet	M.M. Ranieri	J.A. Zipp
T. Domin	L. Kojovic	R. E. Ray	S.E. Zocholl