

**POWER SYSTEM RELAYING COMMITTEE
OF THE
IEEE POWER ENGINEERING SOCIETY**

MINUTES OF THE MEETING

**JANUARY 10-13, 2000
SAN DIEGO, CA**

**POWER SYSTEM RELAYING COMMITTEE
MAIN COMMITTEE MEETING**

**San Diego, CA
January 13, 2000**

I. CALL TO ORDER

Arun Phadke, Chairman

II. APPROVAL OF MINUTES

Rick Taylor, Secretary

The minutes of the Louisville meeting were approved.

III. FINANCIAL REPORT

Rick Taylor, Secretary

The financial report is available upon request from Rick Taylor.

IV. REPORTS OF INTEREST

A. Technical Paper Coordinator's Report

George Nail

The Singapore 2000 Winter Power Meeting will have 42 Proceedings papers, one Panel Session, and one Tutorial sponsored by the Power System Relaying Committee. So far, the Seattle 2000 Summer Power Meeting will have 19 Proceedings Papers on the agenda. I will be needing paper session chairs, so if you plan to attend and can help, please contact me no later than March 1. We will need three session chairs.

B. Power Engineering Society Reprot

Gary Michel

Nothing to report.

C. CIGRE

Chuck Mozina

The most recent meeting of Study Committee 34 (Power System Protection & Local Control) was held in Florence, Italy on October 11-15, 1999. Ten U.S. relay engineers attended the conference. A total of thirteen papers were accepted by the organizing committee from U.S. authors on three preferential subjects. At the Florence meeting, four (4) new Working Groups were formed on the following subjects:

- WG34.01-Autoreclosing and Local System Restoration—UK Convenor
- WG34.15-Distance Protection—US Convenor
 - WG34.16-Testing, Maintenance and Extensions of Modern Automation System—US Convenor
 - WG34.17-Software Models for use with Electromagnetic Transient Analysis Programs—Canadian Convenor

Next meeting of SC34 will be in Paris, France August 28-31, 2000. Three Colloquium sessions will be held by SC34 on the following subjects:

- Use of Communication in Protection and Substation Control: Current and Future Practice
- Joint SC34/35 Teleprotection Workshops
- Replacement of Conventional CT's and VT's by Novel Current and Voltage Sensors: Impact on Substation Design—Joint with SC12/23

The year 2001 meeting of SC34 will be held in Sibiu, Romania, September 10-15, 2001. Abstracts are due December 31, 2000 with final paper due March 31, 2001. Paper length is limited to 6 pages in CIGRE format. A "call for papers" will be issued later this year with further details. Papers must address the following Preferential Subjects:

| | |
|-------------------------|---|
| Preferential Subject #1 | Optimization of protection performance during system disturbances |
| Preferential Subject #2 | Numerical relay setting procedures and tools |
| Preferential Subject #3 | Coordination of digital relays and conventional instrument transformers |

D. EPRI

John Burger

No written report.

E. IEC REPORT

Eric Udren

TC 95 RELAY STANDARDS

Our US Technical Advisory Group is developing votes and comments for three relay standard projects drafts:

1. **60255-25 FDIS (Final Draft International Standard):**

Electromagnetic emission tests for measuring relays and protection equipment. This is the final draft of a standard we had seen in earlier revisions. PSRC has no emission test standards. This test is elaborate and difficult to run, but the acceptable emission levels are not unduly severe. We have commented on prior drafts and find it generally acceptable.

2. **60255-22-4 CD (Committee Draft):**

Fast Transient Test. The IEC and IEEE have separate revisions of their respective fast transient tests taking place at the same time. Our TAG, with the help of PSRC revision Chairman Jeff Gilbert, has found 9 problems, many of which are technically significant. If our comments are accepted by the IEC WG, we will have better coordination of these standards - users will not have to make two different setups to execute the two tests. We think we are helping them get their standard right.

3. **60255-22-7 CD (Committee Draft):**

Power Frequency Conducted Immunity Test. First draft of a new test for which the PSRC has no equivalent. The test applies 100 to 300 volts at power frequency to the relay ports through a specified RC network. The US had not supported the initiation of this project, and we are still determining what if any good it does and what comments to make about it.

TC 57 SUBSTATION CONTROL AND COMMUNICATIONS STANDARDS

The major activity of relaying interest is the project IEC 61850, Communications Networks and Systems in Substations. This is to be the common international communications protocol standard for LAN-based substation protection and control. The work is being done in TC 57 WG 10, 11, and 12, which met in Berlin in November. Editors' groups continue to revise large drafts already sent as CDs earlier in 1999. These sections describe the object-oriented user layer for substation protection and control systems. There are continuing efforts to reconcile UCA and European manufacturers' approaches to details. Joint task forces met to solve specific technical issues, a new one being compliance testing of LAN-compatible IEDs. The next meeting takes place in Orlando in March.

F. Standard Coordinator's Report

Miriam Sanders

The IEEE Standards Web page has Word templates and the style manual that can be downloaded for your use in developing a new or revised standard.

[Http://standards.ieee.org/](http://standards.ieee.org/).

Starting in May -2000 Moh Sachdev will be taking over as Standards Coordinator. We will try to make this an easy transition for all. Thanks to everyone for their assistance over the past 5 years. It has been a learning experience as we have transgressed through the many changes the IEEE has seen.

Please note that January 200 brings another change for us in the standards developments. That is the next step for the metric policy implementation. It states:

After 1 January 2000, 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 visit:

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

Standard Boards Activity

1. PARs to be submitted:
 - None
2. PAR Submittals (January 2000)
 - PC37.117 Guide for the Application of Protective Relays Used for Abnormal Frequency Load Shedding and Restoration
 - PC37.116 Guide For Protective Relay Application To Transmission-Line Series Capacitor Banks
 - PC37.105 Standard for Qualifying Class 1E Protective Relays and Auxiliaries for Nuclear Power Generating Stations
 - PC37.109 Guide for the Protection of Shunt Reactors
3. PAR Approvals
 - None
4. PAR Expirations coming up
 - PC37.96 Guide for AC Motor Protection
5. PAR Extensions requested
 - PC37.90 Standard for Relays and Relay Systems Associated with Electrical Power Apparatus
 - PC37.90.1 Standard for Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems
6. PAR Withdrawals
 - None
7. Balloting Bodies requested
 - None
8. Standards in Balloting Process

- PC37.104 Guide fro Automatic Reclosing of Line Circuit Breakers for AC Distribution and Transmission Lines.
 - PC37.108 Revision to Guide for the Protection of Network Transformers
 - PC37.99 Revision to Guide for Protection of Shunt Capacitor Protection
 - C37.109 Guide for the Protection of Shunt Reactors (Reaffirmation)
 - C57.13.3 Guide for Grounding of Instrument Transformer Secondary (reaffirmation)
 - PC37.96 Revision to Guide for AC Motor Protection.
 - C37.101 Guide for Generator Ground Protection.
 - PC37.95 Revision to Guide for Protective Relaying of Utility-Consumer Interties.
 - C37.90.2 IEEE Standard for Withstand Capability of Relay Systems to Radiated electromagnetic Interference from Transceivers (Reaffirmation)
 - C37.102 IEEE Guide for AC Generator Protection (Reaffirmation)
9. Standards Submitted to Standards Board
- PC37.91 Transformer Protection Guide (To be re-circulated)
 - C37.98 Standard for Seismic Testing of Relays (Reaffirmation)
 - C57.13.1 Guide for Field Testing of Relaying Current Transformers (reaffirmation)
 - C37.105 Standard for Qualifying Class 1E Protective Relays and Auxiliaries for Power Generating Stations (Reaffirmation)
10. Standard Approvals
- C37.113 Guide for Protective Relay Applications of Transmissions Lines
11. Standard Extensions
- C37.91 Guide for Protective Relay Applications to Power Transformers, June 1999
12. Standards in need of review
- 1344 IEEE Standard for Synchrophasors for Power Systems
 - C37.90.2 IEEE Standard for Withstand Capability of Relay Systems to Radiated electromagnetic Interference from Transceivers
 - C37.102 IEEE Guide for AC Generator Protection
13. Reaffirmations needed
- None
14. Reaffirmations granted
- None
15. Standards Withdrawn
- None

Standards Board Meeting Schedule:

| | |
|---------------------------------|-------------------------|
| PAR/Standard Submittal Deadline | Standards Board Meeting |
| February 18, 2000 | March 30, 2000 |
| May 5, 2000 | June 21, 2000 |
| August 11, 2000 | September 21, 2000 |
| October 27 | December 7, 2000 |

G. Substation Committee Report

John Tengdin

The Substations Committee, Data Acquisition, Processing and Control Systems Subcommittee (C0)met jointly with the Power System Relay Committee at their winter meeting in San Diego, CA January 10 through 14, 2000. All three of the subcommittee Working Groups held meetings as well as the three Task Forces.

Work continues on the P-1525, the standard for integrated protection and control, under Working Group C-2, Applications of New Technologies in Substation Monitoring and Control, Task Force 4. The document is now ready for coordination with Draft 1 having been completed.

Work also continues P-1379 the Recommended Practice for RTU to IED Communications which is being converted from trial use status to that of a Recommended Practice. The task is the effort of Working Group C3, Electric Network Control System Standards, Task Force 1. They expect to have a draft ready to ballot by the Summer Power Meeting 2000.

Working Group C3 is also working on C37.1, the "Scada Standard". The document is being heavily revised to be more in tune with distributed substation control architecture using IEDs. No target date is set for completion yet.

Working Group C1 also held a meeting to review the work in IEC61850 on a Substation Configuration Language.

C2TF2 met to review the draft document being supplied to the PES Transformer Committee and to the PES Switchgear Committee to discuss communications interfaces to condition monitoring equipment. The document will recommend the use of specific existing standard protocols.

In addition to the Working Group and Task Force meetings C0 sponsored four work sessions to allow members to give their undivided attention to work on P-1525, C-37.1, P-1379 and the development of a new tutorial on advanced automation.

As Chair of C0, I would like to personally extend our gratitude to the Officers of PSRC for allowing us to join your meeting. You have been gracious hosts and made this joint meeting an outstanding success for us. Without your hospitality we would have had to work much harder to have a meeting to make up for the lost opportunities to meet at the Winter Power Meeting.

J. W. Evans

Chair - Data Acquisition, Processing and Control Systems Subcommittee

V. SUBCOMMITTEE REPORTS

Subcommittee reports are available under "Minutes" on the Web Page.

VI. OLD BUSINESS

There was a general discussion about how to handle the Guide to Protective Relay Applications to Transmission Lines, the output of WG D14. At issue was the question of withdrawing the PAR and issuing the guide as a PSRC document, which would facilitate the general distribution of the guide to interested parties without their having to pay an excessive charge (the price of an IEEE guide). After considerable discussion, it was the opinion of PSRC that the work should proceed as planned – i.e. it should be an IEEE guide as originally planned.

VII. NEW BUSINESS

Nothing to report.

FUTURE MEETING LOCATIONS AND DATES:

May 8-11, 2000

September 11-14, 2000

Grand Rapids Michigan

Andover, Massachusetts

Amway Plaza Hotel

Rolling Green Inn

January 8-11, 2001
May 21-24, 2000
September 2001
January 2002

Austin, Texas
Vancouver, BC, Canada
Madison, WI (?)
Laguna Cliffs, CA (?)

Hilton-Austin North
The Empire Landmark

B. ADVISORY COMMITTEE

Chair: A.G. Phadke

Vice Chair: G.R. Nail

January 11, 2000

Each of the subcommittee chairs discussed outstanding issues in their subcommittees. The decisions made on these issues are included in the respective subcommittee reports.

The PSRC commemorative volume was distributed to those attending the meeting in San Diego. PSRC members who could not attend the meeting will be sent complimentary copies of the volume. It will also be sent to PES officers and Chairs of PES technical committees. The Long Range Task Force is going to come up with a plan to send additional copies of the volume to officers of various utilities and power companies who would be in a position to approve participation by their employees in future PSRC meetings.

The web master reminds each working group to put some material (on which they may be working) on their web page. At present, some of the web pages are blank.

Subcommittee chairs are also reminded to get their minutes to the web master in a timely manner.

B1: AWARDS AND TECHNICAL PAPER RECOGNITION

Chair: Brad Nelson

Vice Chair: Damir Novosel

Output: Review & Recommend PSRC Publications and Awards

Expected Completion Date: Continuous

The Awards and Technical Paper Recognition WG met to finalize the process and timelines for selecting nominees for the IEEE Baker, Fink and Thompson awards. In addition, the group announced and recognized the following award winners at the Main Committee meeting:

PSRC Distinguished Service Award – Miriam Sanders

PSRC Career Service Recognition – Al Darlington

PSRC Prize Paper Award – Microprocessor Based Instrument for Detecting and Locating Electric Arcs, by T. S. Sidhu, Gurdeep Singh and M. S. Sachdev

PSRC Working Group Recognition Award (for a technical report) – Series Capacitor Bank Protection, chairman A. Elneweih

PSRC Working Group Recognition Award (for a Standard or Guide) – C37.112 IEEE Standard Inverse-Time Characteristic Equations for Overcurrent Relays, chairman G. Benmouyal

B2: FELLOWS AWARDS

Chair: J.S. Thorp

Output: Review Fellow Nominations

Expected Completion Date: Continuous

The Working Group did not meet. Jim Thorp reported that effective January 1, 2000 T.W. Cease and Roger Ray had been elected Fellow of the IEEE.

B3: MEMBERSHIP COMMITTEE

Chair: M. Swanson

Output: Improve PSRC Participation

Expected Completion Date: Continuous

1999 Utility attendee growth was from 67 to 70 during the year.

Conducted an interest survey on possible computer skill education subjects. George Nail has this report. The most needed classes were web-site creation and maintenance, working with WORD, and working with spreadsheets.

Coordinated computer skills education class, WG web-site creation and maintenance, at the Grand Rapids meeting, 1.2 hours during the first session on Tuesday. Moh Sachdev will teach it as part of the PSRC web-site WG meeting.

Corresponded with Albuquerque and Louisville attendees. Assisted with George Nail's new membership session on Tuesday morning. There were 16 new attendees, including 8 people from utilities.

B4: O/P MANUAL & WG TRAINING

Chair: John Appleyard

Vice Chair: M. Swanson

Output: Update the O/P Manual

Expected Completion Date: Continuous

WG B4 Chair met on January 11 with 42 members attending and John Appleyard presiding. Eric Udren gave a comprehensive report on IEC scope, policies, and operations.

B8: BIBLIOGRAPHY AND PUBLICITY

Chair: T.S. Sidhu

Output: Transactions Paper

Expected Completion Date: Continuous

The working group met with five members and one guest present. The 1998 bibliography paper has been approved for publication in the IEEE Transactions on Power Delivery. The 1999 paper is about 80% complete and will be ready for review by the WG members by the end of January 2000. A report highlighting the 1999 activities of the PSRC has been sent to the editor of the PES Review and should be published in a couple of months. No NERC Reports has been published for the last three years. Will Marsh will check on this and will report to the working group.

B9. PSRC WEB SITE

Chair: M.S. Sachdev

Output: Web Sites

Expected Completion Date: Continuous

The Working Group met at 8:00 AM on January 11, 2000 in Carmel Ballroom I, Mission Valley Hilton, San Diego, CA. Eight members and fifteen guests attended the meeting. Mohindar Sachdev distributed copies of the agenda that had previously been distributed by Email.

1. **Assignment:** The following assignment proposed by the chair was discussed and was approved.

To prepare, modify, extend, maintain and keep up to date a Web Site for the PSRC. Also, to provide assistance to Subcommittees and Working Group representatives for preparing, modifying, extending, maintaining and keeping up to date their Web Sites.

2. **Domain name:** The Chair then reported that the domain name pes-psrc.org was registered. The PSRC web sites can now be reached using the following address.

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

The Subcommittee Web sites can be accessed by using the following addresses.

<http://www.pes-psrc.org/b/>

<http://www.pes-psrc.org/c/>

<http://www.pes-psrc.org/d/>

<http://www.pes-psrc.org/h/>

<http://www.pes-psrc.org/i/>

<http://www.pes-psrc.org/j/>

<http://www.pes-psrc.org/k/>

The subcommittee web sites can be reached either by using their domain names or via the links provided at the PSRC Web site. At this time six Working Groups have their own Web sites that can be accessed from the links provided on the SC Web sites.

3. **Internet provider:** The chair reported that PSRC has signed up with the pair.com Internet provider. They can not provide facilities for Internet Locating Service.
4. **PSRC documents:** The chair reported that a page listing the publications of the PSRC has been added to the PSRC web site. On this page, hyper links have been provided for downloading the documents.
5. **Integrity of documents:** The issue of integrity of documents posted on the Web site was discussed. While it was agreed that this is a concern, there appears to be no practical solution at this time unless considerable time and effort is directed towards this goal.
6. **Web site search list:** A search for "Power System Relaying Committee" using Alta Vista, Yahoo etc. does not point to the home page of the PSRC. This issue is being pursued at this time.
7. **Change of Chair:** Effective May 2000, Steve Conrad will take over the Chair, will look after the web site of the PSRC and, will co-ordinate with the Subcommittee web site activities.

C: SYSTEM PROTECTION SUBCOMMITTEE

Chair: J. S. Thorp

Vice Chair: D. Novosel

The System Protection Subcommittee met on January 12, 2000 at 2:45 PM in Malibu Ballroom I, Mission Valley Hilton Hotel, San Diego, CA.

Working Group Reports

C1: SOFTWARE MODELS FOR RELAYS

Chair: P. G. McLaren

Vice Chair: K. K. Mustaphi

Established: 1995

Expected Completion Date: 1999

Output: IEEE Transactions Paper

The WG did not meet.

C3: NEW TECHNOLOGY FOR TRANSMISSION AND DISTRIBUTION PROTECTION

Chair: A. P. Apostolov

Vice Chair: P. A. Solanics

Established: 1994

Expected Completion Date: 1999

Output: Report to Main Committee and IEEE Transactions Paper

WG C3 New Technology for Transmission and Distribution Protection met for a single session on 1/11/2000 with 18 members and 45 guests present.

Two presentations were made and discussed by the working group:

1. Substation Integration in Duke Power (Barry Jackson, Duke Power) :

The presentation and discussions were related to a recent upgrade and integration of microprocessor relays in an Integrated Substation Protection and Control System in Duke Power.

2. Comparison of Ethernet Substation LAN Topologies (Dave Dolezilek, SEL):

The presentation and discussions were related to the implementation of different Ethernet LAN topologies, their reliability and availability.

The next meeting will be in May 2000. The agenda will be finalized by March 31, 2000.

C6: WIDE AREA PROTECTION AND EMERGENCY CONTROL

Chair: M. Begovic

Vice Chair: D. Novosel

Established: 1996

Expected Completion Date: 2000

Output: Report to Main Committee

WG met in a single session with 9 members and 11 guests. In the absence of the chairman, the vice-chairman, D. Novosel, was chairing the meeting.

Daniel Karlsson gave a presentation on CIGRE activities in Wide Area Protection. Daniel is a convener of the CIGRE WG on System Protection Schemes. M. Begovic and D. Karlsson will do documentation and exchange of documents between PSRC and CIGRE.

The report outline was reviewed and revised. Existing material and contributions need to be synchronized with the new outline. This is assigned to the chairman, M. Begovic. Additional assignments are:

- Review of NERC disturbances on the web: J. Thorp
- Description of Generation Rejection Remedial Measure: M. Ibrahim
- Description of 1965 blackout: M. Ibrahim
- Review of practical examples: C. Henville

The WG will meet at the next meeting in May in a single session.

C7: EMTP APPLICATIONS TO POWER SYSTEM PROTECTION

Chair: D. Tziouvaras

Vice Chair: L. Kojovic

Established, 1997

Expected Completion Date: 1999

Output: Report to Main Committee

The WG met in San Diego on January 11, 2000, with 6 members present. The WG is in the process of obtaining permission from PES to present the EMTP tutorial during the PES Summer Meeting in Seattle, WA.

Members of the WG agreed to supply any changes to the documents and comments by February 15th to allow sufficient time for the tutorial to be formatted according to PES publication guidelines and make it available to IEEE for printing.

C8: PHASOR-BASED MODELS FOR ANALYZING RELAY PERFORMANCE

Mike Meisinger, Chair

M. S. Sachdev, Vice Chair

Established, 1997

Expected Completion Date: 2002

Output: Transactions Paper

The Working Group met at 9:30 AM on January 11, 2000 in Newport I room, Mission Valley Hilton Hotel, San Diego, CA. Fourteen members and nine guests were present.

Two writing contributions submitted by the members were consolidated into the draft of the Working Group paper prior to the meeting to facilitate review. Copies of the draft were distributed at the meeting.

The document was reviewed for the suitability of the content of the contributions. It was agreed that the contributions addressed the issues included in the outlined adopted by the Working Group but do not meet the objectives of the task at hand. It was finally decided that the Chair and the Vice Chair collaborate for preparing a new outline of the paper that should be discussed at the next meeting in May 2000.

A new member, Irwin Hasenwinkle, joined the WG.

C9: UNDERFREQUENCY LOAD SHEDDING AND RESTORATION

Chair: A. Apostolov

Vice-Chair: K. Behrendt

Established, 1999

Expected Completion Date: 2000

Output: Guide on the Application of under-frequency load shedding and restoration

The working group met on Wednesday, January 12th, with 21 members and 23 guests present. The PAR has been submitted and the working group document has been assigned the number PC37.117. The working group reviewed the guide's scope, purpose, and outline that were developed at previous meetings. Attention then focused on developing writing assignments for items in the outline. The outline, and writing assignments received to date, will be emailed to members for their review. This information will also be posted on the working group website when that is available in the near future. New writing contributions will also be added to the web site as they are received. Writing contributions should be submitted by mid April to allow time for these contributions to be reviewed before the next PSRC meeting.

The scheduled completion date remains December 2001.

C10: EFFECTS ON CHANGING UTILITY ENVIRONMENT ON PROTECTIVE RELAYING

Chair: J. DeLa Re

Vice-Chair: R. Hunt

Established, 1999

Expected Completion Date: 2002

Output: Report to Main Committee

The WG met at 9:30 am, Tuesday, January 11, 2000, with 30 attendees. The chairman distributed copies of the minutes of the last meeting and e-mail posted December 10, 1999.

The discussion included the input from a number of the participants from this country, as well as from foreign countries, with information regarding de-regulation and its impact on protection practices. The inputs were presented by:

| | | |
|-----------------------------|-------------------------------------|--------|
| Norberto Santiago Elustondo | ZIV Aplicaciones y Tecnologia, S.A. | Spain |
| Tom Domin | PP&L Resources | USA |
| Daniel Karlsson | ABB | Sweden |
| Vahid Madani | Pacific Gas & Electric | USA |
| Mahamid Ibrahim | New York Power | USA |
| Kazik Kuras | GE Power Management | Canada |
| J. Rothwell | Wisconsin Electric | USA |

Assignments and Action Items:

- Each of the above listed participants will write a brief description regarding the changes to the industry environment and its impact to protection. We will have a brief presentation with the gathered material during our next meeting in Grand Rapids, May 2000.
- The information gathered will be distributed among the members and guests of the WG prior to our next meeting. Questions, comments and discussions may be mailed to Jaime De La Ree to be included in a document, which will be used to guide the discussions of our next meeting.

Change of Vice-Chair: Mr. Rich Hunt will replace Mr. T. Sezi as Vice-Chair of the WG.

CTF: PROTECTION ISSUES DURING SYSTEM RESTORATION

The Task Force met on January 12, 2000, with 29 participants in attendance. Thirteen of them indicated that they are willing to become members and contribute to the work. It was clear from the discussions that there is sufficient interest to form a WG.

The following title and assignment for the WG were agreed to:

Title: Protection Issues during System Restoration

Assignment: To study relaying issues during system restoration following a major disturbance and suggest remedial measures.

It was also agreed that the initial output of the WG shall be a PSRC report that would be later summarized in a transaction paper. Demetrious Tziouvaras volunteered to be the vice-chair of the WG. If the formation of the WG is approved, two presentations will be scheduled at the first meeting in May 2000.

NERC Liaison Report to SC

The Phase 2 Compliance Testing program is getting kicked off. 5-8 Protection & Control-I Standards and 7 measures are in Phase 2. Nothing else of significance to report.

New Business

D. Novosel proposed to create the Task Force to evaluate if there is interest to create a new working group on "Power Quality and Protective Relaying" and, if this is the case, to define the assignment. It is decided to have a TF meeting in May in a single session.

It was proposed that the following issues be considered at the TF meeting.

- Impact of present practices on power quality
- Power quality monitoring functions in the relays
- Standards related to power quality.

D: LINE PROTECTION SUBCOMMITTEE

Chair: R.M. Westfall,

Vice Chair: Mark Carpenter

The Line Protection Subcommittee met in San Diego on January 12, 2000 with 21 members and 24 guests present and Chairman Ron Westfall presiding. The minutes of the Louisville meeting were approved.

Working Group Reports

D1: EFFECTIVENESS OF DISTRIBUTION PROTECTION

Chair: P. Carroll

Vice Chair: C. Fink

Established: 1994, Output: IEEE Paper

Expected Completion Date: 2000

Status: Draft #2

The working group met with 9 members and 21 guests. After introductions and approval of the September meeting minutes, John Tengdin gave a presentation on the use of LAN/WANS to protect distributed generation on utility feeders. The working group asked questions and discussed issues concerning relay protection using this type of communication medium. Thanks to John for his presentation. The meeting continued with the chairman asking the group for ideas and volunteers for future meeting presentations. The working group discussed experiences and possible trends related to customers requesting network service from utilities. Also, one attendee expressed interest in surveying the working group utility representatives to determine their feeder reclosing practices. The meeting then continued with the distribution of the working group survey mailing list. Members were asked to review the list, make corrections and additions as necessary and send changes to Patrick Carroll by January 25, 2000. The survey will then be distributed to John Zipp, Barry Jackson, Charlie Fink and Patrick Carroll for disk copying and mailout assignments. It is expected that we will receive the survey responses back by our next meeting.

D2: FAULT LOCATING

Chair: Karl Zimmerman

Vice Chair: Damir Novosel

Established: 1996, Output: IEEE Guide

Expected Completion Date: 2000

Status: Draft #3

Working group D-2 met on Wednesday, January 12, 2000 with 7 members and 27 guests. Draft 4 is in process to incorporate comments and to comply with the IEEE Style Manual. The draft will be available to all working group members, guests, and coordinating bodies by March 1, 2000. Karl Zimmerman (chair), Damir Novosel (vice-chair), and Tony Seegers will discuss via phone conference before draft is released. We issued two writing assignments on some revised sections of the guide.

Bogdan Kaszetenny, GE Canada and M. Saha, ABB Sweden presented, "Latest Developments and Practical Issues with Fault Location – Manufacturers' Perspective", which provided some interesting developments in fault locating on series compensated lines and distribution feeders.

D4: AUTOMATIC RECLOSING

Chair: W.M. Strang
Vice Chair: Mal Swanson
Established: 1996, Output: IEEE Guide
Expected Completion Date: 2001
Status: Current Draft #3

Working Group D4, Automatic Reclosing, met on January 11, 2000 with 12 members and 3 guests attending and Mal Swanson presiding. Draft 6 was distributed to the group during the meeting with the current changes. The document will be modified to incorporate additional changes in the "blocking for bus faults" area and in the clarification of two more definitions.

Bill Strang will proceed with soliciting a balloting body.

D6: TRANSMISSION LINE PROTECTIVE SYSTEMS LOADABILITY

Chair: Tony Seegers
Vice Chair: J.B. Williams
Established: 1997, Output: Special PSRC Publication
Expected Completion Date: 2001
Status: Draft 4

Working Group D-6, Transmission Line Protective System Loadability, met with 10 members and 20 guests. Draft 4 was circulated. It now exists in RTF format. Plans are to clean up Draft 4 by the end of January and to send out a "survey for comment" to the working group to be returned by February 15th. If the results of the first survey are favorable, the group will recirculate the paper and extend the survey to include the subcommittee members.

The Working Group has formed an editorial team to expedite the resolution of survey issues. The team consists of Tony Seegers, Dan Hamai, Karl Zimmerman, Ron Onate, and Mike Agudo.

Ron Onate and Mike Agudo have been accepted as new working group members.

The planned output of this group is a PSRC sponsored document. Approval by the PSRC officers will be needed. In addition, as much review by other committee members as is practical is desired. The final publication form of this document has not yet been determined. The possibility of posting on the PSRC web has been discussed.

D10: EMTP REFERENCE MODELS FOR TRANSMISSION LINE RELAY TESTING

Chair: K. Mustaphi
Vice Chair: T. Sidhu
Established: 1998, Output: Transaction Paper
Expected Completion Date: 2001
Status: New Working Group

Working Group D10 met on Tuesday, January 11th, with 11 members and 10 guests. The EMTP file for the system model chosen by the members is available now. After thorough discussion, it was decided that each component of the model would have specifications so that other EMTP version users can use the standard model. Several members accepted assignments, which are due by March 15th. The first draft is expected to be ready before the next meeting.

D12: LINE PROTECTION GUIDE PRESENTATION

Chair: J. Zipp
Vice Chair: Elmo Price

Established: 1998, Output: Tutorial
Expected Completion Date: 2000
Status: new working group

Working Group D12 met to review the draft presentation to be presented at Georgia Tech and Texas A&M. The editing team will take the comments received and modify the presentation. The presentation will be given at the meetings coming up this spring. The presentation will cover the content of the guide but not try to teach all the content. It will expound on what is unique about the guide and point out the value of the document.

D14: TRANSMISSION LINE PROTECTION GUIDE

Chair: W.M. Carpenter
Vice Chair: A.N. Darlington,
Established: 1992, Output: IEEE Guide
Expected Completion Date: 1999
Status: Awaiting Final Publication from IEEE

Working Group D-14 did not meet in San Diego. The transmission line protection guide was approved by the IEEE Standards Board in September 1999 and was received back from the IEEE editors on January 6, 2000 for final review prior to publication. It should be available for sale at the Texas A&M Relay Conference in April.

Liaison Reports

- 1. Distribution Automation Working Group, Distribution Subcommittee, & D Committee: J. T. Tengdin.** No report.
- 2. P1124 - Guide for Analysis and Definition of DC Side Harmonic Performance of HVDC: M. S. Sachdev.** No report.

Old Business

None

New Business

There was discussion of the withdrawing the PAR for the Transmission Line Protection Guide and publishing it as a PSRC Publication. The primary reason for considering this action was the expected high cost of the Guide. Also, there was discussion by some that the Guide was more of a description of practices than it was a guide. Following the subcommittee meeting, there was discussion of this proposed PAR withdrawal at the PSRC Main Committee meeting. It was decided to continue to proceed with the Guide through the IEEE formal processes.

General Discussion

None.

H: RELAY COMMUNICATIONS SUBCOMMITTEE

Chair: M. S. Simon

Vice Chair: K. J. Fodero

The Relay Communications Subcommittee met on January 12, 2000, in San Diego, CA.

Working Group Reports

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

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 reconvene to resolve any comments regarding these clauses as well as verify that there is no duplication with other elements of the guide.

H2: COMTRADE STANDARD REVISION

Chair: R. Ryan

Vice Chair: C. Shank

Established: 1995

Output: Revised Standard C37.111-199x

Expected Completion Date: May 1999

Chairman Bob Ryan and VC Chuck Shank were unable to attend so the WG did not meet. The revised standard has been published. Mike Xavier has been handling revisions of the WG paper, but no new information has been contributed. The paper has not been accepted at any further relay conferences. Presentation was made at one external conference last year, the Disturbance Recorder Users Group meeting. The last remaining task is to have the paper published, no progress on this front as yet.

H3: COMTRADE USERS WORKING GROUP

Chair: C. Shank

Vice Chair:

Established:

Output: Standard

Expected Completion Date:

The working group did not meet.

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:

Established: 1997

Output: Standard
Expected Completion Date: 1999

H4 met in single session. Thirty members and guests attended. The minutes were reviewed and accepted. The agenda was reviewed and accepted.

H4 objective is to release C37.115 for electronic ballot by the end of 2001. This is about 5 years after the PAR was approved, therefore the chairman will submit by March 2001, a request to the PSRC Standards Coordinator to extend the PAR completion date to the end of 2001.

Draft 1 was placed on the FTP site for review in December. H4 members and guests provided comments and recommendations at the meeting. Additional comments and recommendations will be sent by EMAIL to the H4 Chairman by February 28th. These contributions will be reviewed, and as appropriate integrated into Draft 1. Then in mid-March, Draft 1 will be released for coordination to those organizations listed on the PAR.

H5: APPLICATION OF SUBSTATION PEER TO PEER COMMUNICATIONS

Chair: M. Yalla
Vice Chair: M. Adamiak
Output: Paper
Expected Completion Date: 2001

H5 met on January 11, 2000 to finish up work on the subject document. A number of leadership changes in the working group were made. John Beatty resigned as chairman and Murty Yalla (former Vice-Chairman) assumed chairmanship. Mark Adamiak accepted the vice chair position.

The August 30, 1999 draft of the document was passed out and it was recognized that a number of the changes to the sections had not been incorporated in this draft. A number of items were reviewed and actions established to bring this draft up to date. The present plan is to ballot the entire working group by May 1, 2000 for comments of substance. The comments will be discussed at the May PSRC. A final version will be prepared after this meeting and sent to the subcommittee and main committee for comments of substance. Comments received from this review process will be discussed at the September 2000 meeting and a final version created and posted to the PSRC web site.

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

Met on January 12th in a single session meeting with 18 members and 37 guests for a total of 55 present.

After introductions and the minutes from the Louisville meeting were discussed, the working group heard the latest status of IEC61850, The utility initiative project, and IEEE TR1550 from Jack Robinson and Kay Clinard.

John Burger then led the working group in discussion as to an outline for the report. Previously defined topics were discussed and additional topics were added. Writing

assignments will be made at the May 2000 meeting. A possible title change and scope of the report were also discussed, but were dismissed. At the May meeting, the working group will meet in a single session.

H7: INTER RELAY COMMUNICATION PROTOCOL STANDARD

Chair: G. Michel

Vice Chair:

Established: 1997

Expected Completion Date:

Fifteen members and guests attended the single session meeting January 11, 2000 at the Mission Valley Hilton. Action items and minutes from the Louisville PSRC Meeting were reviewed. Several action items were made for the next meeting including writing assignments that are due the end of March, 2000. This material will be incorporated into a Draft 2 document for the next meeting in May.

Please use the title "Optical Fiber Interface Standard between Relay and Mux" in the future IEEE PSRC Meeting Agenda.

H8: FILE NAMING CONVENTION FOR TIME SEQUENCE DATA

Chair: Jim Ingleson

Established: May 1999

Output: Report to the PSRC

Expected Completion Date: September 2000

Six members and one guest were present. The attendance list was passed, introductions were made. Bob Ryan has asked that his name be removed from the membership list.

The Chairman distributed copies of the meeting announcement, an e-mail containing questions from Mike Xavier, minutes of the September meeting, and the agenda from September meeting.

After lengthy discussion, the group decided to alter and simplify the long filename as follows:

- The delimiting character will be changed from a dash to a comma. The contents of the file name will be as follows, in order:
- Start time and date in the form: yymmdd,hhmmssmmm - The start time can be specified to the required precision.
- Time Code (-5S) - Indicates offset from UTC is -5 hours, and standard time in use, so this time code would be proper for EST. It was generally agreed that some users will want to be able to use local time, either standard or daylight, and some will want to use UTC. This code is subject to change if we find that there is a recognized standard time code. The time code would not be necessary if our standard file name allowed only UTC time, but the group has decided against time. (Note: UTC is the international abbreviation for Universal Coordinated Time, which used to be called GMT)
- Substation Identifier - Each user can formulate their own code for the location of the originating device. This is a variable length field and can contain letters, numbers, and some punctuation marks. Characters disallowed are: , ? " / \ < > * | and : i.e. comma, question mark, quotation mark, forward slash, back slash, less than, greater than, asterisk, pipe, and colon.
- Device Identifier - Each user can formulate their own code for the originating device, which must be unique within the stations. This is a variable length field and can contain

letters, numbers, and some punctuation marks. Characters disallowed are: , ? " / \ < > * | and : i.e. comma, question mark, quotation mark, forward slash, back slash, less than, greater than, asterisk, pipe, and colon.

- Location Coordinates - 2 fields, optional. The first field is to be an expression of latitude and the second is an expression of longitude. If these fields are left blank the correct number of commas must be included. This will result in three (3) commas when position is omitted. (See annex to minutes added January 21, 2000.)
- Company Name - Each user can formulate their own code for the owner and operator of the intelligent device. This is a variable length field and can contain letters, numbers, and some punctuation marks. Characters disallowed are: , ? " / \ < > * | and : i.e. comma, question mark, quotation mark, forward slash, back slash, less than, greater than, asterisk, pipe, and colon.
- dddhhmmssmmm - The duration can be specified to the precision necessary. The duration is equal to the difference between the first and last record in the file.

The following is an example of a filename for a 72 second file which does not include position coordinates: 000112,140347443,-5s,newscotland,ben716,,nyiso,00000072

We agreed that event is very broadly defined for our purposes. Is there a guarantee of uniqueness? It seems to depend on the choices made by the user. The filename would be guaranteed to be unique is the WG's position and is included.

Some members were in favor of adding information to the filename if the file is to go outside the originating company, but in the end the group decided against this.

We discussed using the entire path name can take care of the things that don't change. In the end we did not include this.

Possible suggested applications - Time line manager, file manager.

Assignments for next meeting:

- Amir - Draft report
- Mark Taylor & Jim Ingleson - Try out the filename.

H9: CONSIDERATION IN APPLYING PLC AND RELAYS TO SPECIAL LINE CONFIGURATIONS

Chair: M. Sanders

Vice Chairman: M. McDonald

Established: 1999

Output: Practical Paper for presentation at regional conferences

Expected Completion Date: 2001

H9 Working Group met for the first time in a single session on January 11 with 7 members and 19 guests. Received assignments were passed around for reference. Several additional topics were suggested as follows: distribution PLC, coupling methods, carrier "holes", use of non-directional versus directional relays for carrier start, single side band and digital PLC, non-license issues, PLC references, hybrid and tuner/trap applications. Several writing assignments were accepted and are due to the chair by March 31, 2000.

Scope: The working group will create a practical paper for presentation at regional conferences that will educate relay engineers and technicians on application of PLC in relaying functions to special line configurations. Other concerns of the PLC channel may also be addressed.

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

Reviewed status of previous work assignments. I do not have many of these assignments in electronic format and request that you email the outstanding ones to me.

| | | |
|---|------------------|-------------|
| Section 3 | Tim Phillippe | |
| Section 4.1 | Jerry Hohn | I have this |
| Section 4.2 | Jerry Hohn | I have this |
| Section 4.3 | Mark Simon | |
| Section 4.3.2.4 | Jerry Hohn | |
| Section 4.4.1 | Chris Huntley | |
| Section 4.4.2 | Bill Higinbotham | I have this |
| Section 5 | Roger Ray | |
| Section 6.1.4 | Doug Dawson | |
| Table 1 | Ken Fodero | |
| Review S. Bouchey's third comment | Jerry Hohn | |
| Review Roger's revision of sec 5. | Tim Phillippe | |
| Respond to his own questions | Doug Dawson | |
| Section 6.1.4 revisions | Bill Higinbotham | |
| Section 4.1 & 4.2 revisions per discussions | Jerry Hohn | I have this |
| Section 4.4.2 revisions per discussions | Bill Higinbotham | I have this |

All of the work assignments are due by March 31st. I will compile them into draft2, which I will circulate prior to the next meeting.

Task Force Reports

HTF1: Switchyard Data Acquisition

Chairman: E. Udren

Established: 1996

Expected Completion Date: 1998

The Task Force met with 10 members and 20 guests to review two developments in IEC process bus standards development in TC57 WG 12:

1. A WG 12 member has put forth an important first brick in the construction of a process bus design for streaming sampled data in a substation control LAN environment. This is a proposal for an addition to the Abstract Communications Services Interface (ACSI) which supports the transfer of sampled process data between the source and the end-using systems using the communications stacks and the physical lines of the LAN. It is an addition to the draft IEC 61850-7-2 giving ACSI for the entire substation automation system. The proposal looks good to the US delegation, but it is a small piece of the whole process bus definition. WG 12 is holding a special meeting in Berlin on January 18 to begin work on a Specific Communications Service Mapping (SCSM) for an Ethernet-based process bus system, another important brick, to be IEC 61850-9-2.
2. The US delegation continues to fight for the Specific Communications Service Mapping for the Serial Point-to Point Ethernet Link for streaming data, to be IEC 61850-9-1.

Originally proposed to meet the needs of another IEC TC, this very practical and useful design concept was almost killed by certain WG 12 members who want to focus on the far more complex LAN application. The US delegation successfully blocked this strong effort to quash the document. The draft will be revised, and will include status data in the message frames, with status quality indication bits for each status point, which the US has pushed since this SCSM was first proposed. Technical details of the 61850-9-1 SCSM were presented at the May 1999 meeting.

Liaison Reports

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

No report available. PSCC Secretary John Newbury promises Summer Power Meeting minutes, when available in some weeks

2. Substation Committee - J. Tengdin

No report

3. IEC TC57 Working Group 10, 11 and 12 Report - J. Tengdin

No report

4. SCC 36 - D. Holstein

No report

Coordination Reports

C93 - Liaison Report on ANSI C93 Committee - Roger Ray

The last meeting of the C93 Committee was held in Arlington, VA on June 14 & 15.

Work at the meeting has continued on the C93.4 standard. This standard covers Hybrids, balance transformers & auxiliary equipment. There is also now a C93 Forum on the NEMA web page and a link to this is on the PSRC web page. Please visit it and look at the activity. Log in as a guest.

The next meeting of the C93 committee will be in San Diego after the PSRC meeting on Jan. 13 & 14. At this meeting we will continue C93.4 work and review of O&P manual.

Old Business

Status of the Amateur Radio Relay League (ARRL) request for an amateur radio band in the utility Power Line Carrier spectrum:

The FCC has authorized 9 amateurs to perform experiments in the area of 137 kHz in the area of Virginia. These experiments will most likely last another 6 months. At this time the FCC may choose to make a decision on the future of the spectrum.

While there have several comments posted on the FCC electronic comment forum, the FCC has chosen not to make a decision at this time. We just have to wait.

If you want to look at the FCC web site to see the history of the proposal, go to www.fcc.gov, electronic comments. The proposal is RM-9404.

New Business

We are being to provide a minimum of a status report in working group minutes rather than indicating "nothing to report". So, even if your group didn't meet, working groups should provide a report to the Subcommittee Vice Chair.

If any working group desires to use the current WEB site feel free to do so. Most have found that text in the RTF format is universally readable by the PSRC membership.

If your working group is using the WEB for distribution of working group drafts they must be zipped (either a zip or a executable) with a password. This allows the working group to control the IEEE copyright.

Copies of IEEE standards can be freely used by working groups in the course of doing IEEE work. No authorization from the IEEE is necessary. If you have trouble getting copies do to your company or photocopy shops policy, you can contact George Nail for a generic letter of permission.

I: RELAYING PRACTICES SUBCOMMITTEE

Chair: Jeff Gilbert

Vice Chair: Larry Smith

The Relaying Practices Subcommittee (SC) met on January 12, 2000, in San Diego, CA. A total of 24 members and 32 guests attended. Minutes of the previous September 1999 meeting were corrected. The revised minutes will be reposted on the web-site. The newly appointed SC chairman, Jeff Gilbert, led the meeting. Gilbert took over because of a change in position for the previous SC chairman, Jeff McElroy. Larry Smith will be the new vice-chairman for the SC. For this meeting, Brad Nelson acted as minutes-taker.

Working Group Reports

I1: REVISION OF IEEE C37.103 - GUIDE FOR DIFFERENTIAL AND POLARIZING RELAY CIRCUIT TESTING

Chair: W.J. Marsh, Jr.

Vice-Chair: J. D. Huddleston, III

Established: 1996

Output: Revision of IEEE C37.103-1990

Expected Completion Date: 2000

Jim Huddleston will replace Larry Smith as the vice-chairman of the WG. The WG chairman will apply for an extension to the original PAR deadline date of September 2000. As outlined in the September 1999 SC minutes, several sections of the document were changed to coordinate with other related WG assignments. At this meeting, draft 7 with figures was handed out. Comments on draft 7 are due to the chairman by March 1, with a new draft 8 to be sent out by the chairman by March 15.

I2: TERMINOLOGY USAGE REVIEW

Chair: vacant

Vice-Chair: J. D. Huddleston, III

Established: 1986

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

Expected Completion Date: Continuing

A set of terms, reflecting changes made through the date of the previous meeting, were distributed, discussed and revised. The WG chairman, Barb Beckwith, resigned and a new WG chairman is sought. The previous vice-chairman, Jim Huddleston, offered to stay on in the vice-chairman role.

I3: RELAY PERFORMANCE MEASURING CRITERIA

Chair: W.M. Carpenter

Vice-Chair: F. Marquez

Established: 1996

Output: Special Publication

Expected Completion Date: 1999

Several utilities presented their 1999 misoperation data. No significant problems were discovered in applying the measuring criteria; however, there was occasionally some confusion in the application of the "K" factor in the equation. The WG's paper "Transmission Protective Relay System Performance Measuring Methodology" is complete and was presented at this PSRC Main Committee meeting. Plans are to present the paper at several area relay conferences. The working group will meet in May to compare relay system

performance results and to develop a charge for continued reporting. The paper is retrievable from the Relay Practices SC web site.

14: IEC STANDARDS ADVISORY

Chair: Eric Udren

Vice-Chair: M. M. Ranieri

Established: 1989

Output: IEC Standards

Expected Completion Date: Continuing

The WG met to discuss three voting documents requiring USNC response:

- 1. 95/88/CD - 60255-22-4, Fast Transient Test** - Committee draft of a revision of a previously existing standard. The WG obtained the assistance of Jeff Gilbert, Chairman of the IEEE Fast Transient revision project for C37.90.1, in identifying differences between the latest IEEE and IEC drafts. We found 9 features on which to comment, several comprising key technical issues on which the IEC draft is out of line with the new C37.90.1, and clearly incorrect in the view of the WG. Comments will be prepared for submission before the end of February deadline.
- 2. 95/87/FDIS - 60255-25, Emission Tests for Relays, Final Draft International Standard.** We have seen the earlier editions of this document and have offered comments, only some of which were accepted. Conducting such a test is unavoidably a major undertaking, but the test limits are reasonable and benign, appropriate for an electrically noisy industrial environment rather than an office environment. We will recheck test levels to be sure there have been no last-minute changes before submitting a favorable vote.
- 3. 95/89/CD - 60255-22-7, Power Frequency Immunity Tests** - Committee Draft for a project to which we had previously objected, but which was accepted by the other member nations. Rated power-frequency voltage of 100V differential-mode or 300 V common mode is applied to ports of the relay through specified RC networks to show immunity to false triggering from parasitically coupled signals. We consider this to be an unneeded test, and can't yet comment on its technical implications. WG members are to review and propose any comments on the draft.

The US TC 95 TAG that resides within the WG 14 has dwindled due to change of employment and the USNC TAG tax issue. The Chairman has found a replacement member from one major relay manufacturer whose representatives recently changed jobs. Some other TAG members need to pay dues to be reinstated on the USNC TAG list.

15: TRIAL-USE STANDARD FOR LOW ENERGY INPUTS TO PROTECTIVE RELAYS

Chair: Eric Udren

Vice-Chair: Peter McLaren

Established: 1992

Output: New Trial-Use IEEE Standard P1331

Expected Completion Date: 1999

The WG did not meet. Balloting steps are being carried out at this time. The chairman has received a draft of an IEC standards project from Technical Committee 38 WG 27 for electronic instrument transformers with digital outputs. Contained within is an analog interface, which is incompatible with the draft IEEE levels. Review and discussions with the IEC TC 38 committee secretary are to take place by March.

16: REVISION OF C37.90 - STANDARD FOR RELAYS AND RELAY SYSTEMS ASSOCIATED WITH ELECTRIC POWER APPARATUS

Chair: Mario Ranieri

Vice-Chair: James Teague

Established: 1993

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

Expected Completion Date: 1999

A total review of draft 8 and comments prepared for this meeting were discussed in detail. The detail review resulted in additional comments and suggestions made to draft 8. New WG assignments were made to incorporate the proposed changes into a proposed draft 9 for distribution and another round of comments from the WG members before the next meeting. Assignments are due to the chairman by the middle of February so the proposed changes may be sent out to the WG members for their final review by March 1. The PAR extension granted in September 1999 was also briefly discussed. If all goes as planned, draft 9 should be our final document. The final draft will be submitted to IEEE with a request that a balloting body be formed.

17: ELECTROSTATIC DISCHARGE TESTING FOR PROTECTIVE RELAYS

Chair: J. Teague

Vice-Chair: M. S. Simon

Established: 1992

Output: New IEEE Standard C37.90.3

Expected Completion: 1999

The WG reviewed and revised draft 2.2. These revisions will be incorporated into a new draft in the next few weeks. This draft will be the final draft and will be forwarded to IEEE for balloting. At the next meeting in May, the WG will begin working on a summary paper.

18: REVISION OF C37.90.1 - SURGE WITHSTAND CAPABILITY (SWC) TESTS FOR PROTECTIVE RELAYS AND RELAY SYSTEMS

Chair: J. G. Gilbert

Vice-Chair: J. Teague

Established: 1994

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

Expected Completion: 1999

Draft 5 was reviewed and minor corrections were noted. Corrections will be incorporated into draft 6 and the draft will be submitted to IEEE for ballot. Development of a summary paper will be started at the next meeting.

19: REVISION OF C37.105 - STANDARD FOR QUALIFYING CLASS 1E RELAYS AND AUXILIARIES FOR NUCLEAR POWER PLANTS

Chair: Subinoy Mazumdar

Vice-Chair: Sahib Usman

Established: 1998 (originally WG J7)

Output: Transactions Paper

Expected Completion Date: 2001

Three WG members submitted completed writing assignments. The assignments were discussed and the comments will be incorporated into the next draft. The need for covering the qualification of digital relays was stressed by the participants. It was suggested that a copy of the recently published EPRI report on the subject be procured and relevant

information included in the revision of the standard.

I11: RELAY TEST PRACTICES SURVEY

Chair: Ed Krizauskas

Vice-Chair: Bill Lowe

Established: 1998

Output: Transactions Paper

Expected Completion Date: 2001

A list of potential recipients of the "Relay Test Practices Survey" was distributed to the attendees. The list consisted of names, affiliations and e-mail addresses of 147 contacts from 96 utilities in the United States, Canada and Sweden. The list was compiled from the PSRC Mailing List and from responses to the e-mail sent last fall to everyone on the PSRC e-mail list requesting contacts from utilities who do not attend PSRC meetings. Members and guests were encouraged to submit additional contacts, utilities and e-mail addresses from anywhere in the world whose utility is not on the list. The survey is expected to be initially distributed on February 1. If additional names and contacts are received after the initial distribution, the survey will be distributed in waves. The suggested time frame for the utilities to respond to the survey was set at 30 days. A representative amount of data should be received by the May PSRC meeting. Also, Jim Ingleson gave a discussion of the WG web site. Jim will place the survey on the WG web page, and Moh Sachdev will place it on the PSRC web page.

I12: REVISION OF C57.13.1 - GUIDE FOR FIELD TESTING OF RELAYING CURRENT TRANSFORMERS

Chair: Mike Meisinger

Vice-Chair: Don Sevcik

Established: 1998

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

Expected Completion Date: 2002

Don Sevcik will take over the WG vice-chairman role from Fidel Marquez. Based on changes in attendance, the previous work assignments were reviewed and reassigned. By April 14 for the Conventional Current Transformer section, Don Ware agreed to revise section 3, and Steve Conrad will work with Paul Drum to revise section 11. Harley Gilleland agreed to lead the work on the Low-Energy-Output Current Sensors section, due to the vice-chairman by April 14. The vice-chairman will combine all the revised sections and distribute the new draft to WG members by May 1. WG members will review the new draft and come prepared to review the draft at the upcoming May meeting. Roger Meacham will review the entire document when it nears its final draft form.

I13: REVISION OF C57.13.3 - GUIDE FOR GROUNDING OF INSTRUMENT TRANSFORMER SECONDARY CIRCUITS AND CASES

Chair: Moh Sachdev

Vice-Chair: Brian Mugalian

Established: 1998

Output: Revision of IEEE/ANSI C57.13.3-1983 (R1990)

Expected Completion Date: 2001

Copies of the inquiry from Ricardo Singh received from Linda A. Gargiulo of the IEEE Standards Activities and the draft of the response prepared by the Chairman were distributed. The draft was approved with minor changes. The Chairman will send the modified response to Linda for forwarding to Mr. Singh.

Eric Udren made a presentation in which he described the signal levels, frequency bandwidth, dynamic range, routing and grounding issues included in P1331 Trial-use Standard for Low Energy Inputs to Protective Relays, prepared by WG I5.

At last September's meeting the WG decided to conduct a survey to determine the present utility practices for grounding secondary circuits and cases. The members were to provide to the Chairman, before October 15, questions that would be suitable for inclusion in the survey. The Chairman received no questions. The members are now to provide questions to the Chairman before January 31, 2000. The questionnaire will be finalized at the May 2000 meeting.

114: TELECOMMUNICATION TERMS/NEW TERMS USED BY PROTECTION ENGINEERS

Chair: Tim Phillippe

Vice-Chair: A. Apostolov

Established: 1998

Output: Special Publication

Expected Completion Date: 2003

The scope and direction of the WG was discussed. The chairman will attend the I2 Terminology Usage WG and the I Relaying Practices SC to determine the original direction of the group, as well as to solicit additional members and terms for definition. The chairman will also discuss with Moh Sachdev the results of the earlier WG's output. All members are to submit a list of terms that they have encountered that they feel they would like to have reviewed in the new document. Of specific concern are telecommunications terms and terms derived from other technological fields that relate to the protection engineer. Please submit these terms no later than two weeks prior to the next meeting.

115: REVISION OF C37.110 - GUIDE FOR THE APPLICATION OF CURRENT TRANSFORMERS USED FOR PROTECTIVE RELAYING PURPOSES

Chair: G. P. Moskos

Vice-Chair: B. Jackson

Established: 1998

Output: Revision of IEEE C37.110-1996

Expected Completion Date: 2003

Barry Jackson gave a presentation on a 230 kV gas-filled column-ct failure. As outlined in the previous SC minutes, the transfer of various ct-related sections between guides was discussed. Writing assignments were discussed and new assignments made for the next meeting.

119: ANALYSIS OF SUBSTATION DATA

Chair: L. Smith

Vice-Chair: C. Shank

Established: 1995

Output: Special Publication

Expected Completion Date: 1999

The WG discussed a draft of the paper describing the process shown in a proposed analysis flow chart. The WG will add several items to the description, along with examples covering basic to complex scenarios.

Task Force Reports

ITF1 Relay Service Letter Database: J. Ingleson. No new activity to report.

- ITF2 Evaluate Suggestion for a Digital Relay Application Guide: M. Sachdev.** The task force will meet at the May 2000 meeting to further discuss this matter.
- ITF3 Evaluate the Need for Revision of C37.98 Standard for Seismic Testing of Relays: Chair: M. Clark, Vice-Chair: M. Bajpai.** The TF's consensus is to review, revise and update the standard. TF members should send their comments by March 30, 2000 for including in the agenda for the May 2000 meeting.

Liaison Reports

- 1. Instrument Transformers Subcommittee of the PES Transformers Committee: Jim Huddleston III.** The Instrument Transformers Subcommittee met in New Orleans on April 12-15, 1999. Word from the meeting is that there is a working group PC57.13.5 Test Requirements for Instrument Transformers of a Nominal voltage of 115 kV and above. The WG is on draft 10 and is chaired by M. Pierre Riffon of Hydro Quebec. Utility users should look it over, and perhaps the PSRC, too. PSRC liaison, Jim Huddleston, suggests the PSRC Relaying Practices Subcommittee chairman contact the Instrument Transformers Subcommittee to request a copy of PC57.13.5 for information and review.
- 2. P420 IEEE Standard Design and Qualification of Class 1E Control Boards, Panels, and Racks Used in Nuclear Power Generating Stations: Cliff Downs.** No activity to report.
- 3. Power System Planning and Implementation Committee:** No liaison.

Coordinator's Reports

- 1. P323 IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations: Munnu Bajpai.** No activity to report.
- 2. P384-NPEC, IEEE Standard Criteria for Independence of Class 1E Equipment and Circuits: Munnu Bajpai.** No activity to report.
- 3. Revision of C57.13-1993 IEEE Standard Requirements for Instrument Transformers (Tom Nelson, chairman): Jim Huddleston.** Nothing new to report.
- 4. Proposed C57.13.6 Instrument Transformers for Use with Electronic Relays and Meters (Chris Ten-Haagen, chairman): Jim Huddleston.** Nothing new to report.
- 5. T&D Committee:** No liaison.

Old Business

No old business was taken up.

New Business

1. The PSRC has a need for paper reviewers. Sign up with Jim Thorp if you have not already done so.
2. From the officers: if there is a need for a WG to copy IEEE standards as part of the work toward the assignment, it is O.K. to do so.
3. WG chairs in this subcommittee - make sure the PSRC web site has at least the following for your WG: WG name, assignment, chairman's name and contact information.

J: ROTATING MACHINERY PROTECTION SUBCOMMITTEE

Chair: R.D. Pettigrew

Vice Chair: S. P. Conrad

The subcommittee met on January 12, 2000 with 14 members and 9 guests present. Minutes of the September 15, 1999 meeting in Louisville, KY were approved. There were no Advisory Committee items of interest brought forth by the Chairman.

Working Group Reports

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

Chairman: G. Benmouyal

Vice-Chairman: E. Fennell

Established: 1996

Output: Standard Revision of IEEE/ANSI C37.106-1987

Expected Publication Date: December 2001

Status: Working on Draft 5

The working group met with 10 members and 7 guests present. Announcement was made that the completion date for the revised guide is March 2001, contrary to what has been thought until recently.

Discussions were held on the corrections brought up to Clauses 5 and 7. Clause 7 will have to include the different regional underfrequency protection requirements.

The deadline for the completion of Clauses 4 and 7 is February 15, 2000. Draft #6 of the guide will be available for the May 2000 meeting.

J2: AC MOTOR PROTECTION TUTORIAL

Chairman: S. Zocholl

Vice-Chairman: (Vacant)

Established: 1998

Output: Tutorial on AC Motor Protection

Expected Completion Date: 2001

Status: Reviewing Working Group Assignments

The WG met with 9 members and 16 guests. The WG reviewed the following three completed assignments:

- 3.1 Locked rotor Protection – George. Parr
- 3.3 Differential Protection – Cliff Downs and Sahib Usman
- 3.7 Synchronous Motors – Phil Waudby

The Chair will retransmit to the WG members the characteristics for the following motors: 1) Westinghouse 600 HP 3600 RPM, 2) US Motors 800 HP 1200 RPM, 3) Toshiba 820 HP 300 RPM, 4) Reliance 3000 HP 3600 RPM

As a new assignment, each member of the working group is to apply motor protection of their choice for the motors listed above, that will serve as examples for the write-ups. The WG then reviewed a set of rules for applying induction motor protection and for selecting CTs for motor protection used by Georgia Power. The rules, which stimulated a useful discussion, will be used as a base and will be expanded. Sahib Usman will review the document to accommodate present practice.

Miroslav Rustic joined the WG as a new member.

J3: REVISION OF THE AC MOTOR PROTECTION GUIDE

Chairman: J.D. Gardell

Vice-Chairman: M. Bajpai

Established: 1993

Output: Standard Revision IEEE/ANSI C37.96

Expected Completion Date: 2000

Status: Resolving Ballot Issues

Five members and 7 guests attended the Working Group meeting. The results of the recent Guide re-circulation were discussed. It was decided that since the wording of sub-clause 5.9, Surge Protection Devices, could not be agreed upon, the text would be removed and a reference would be made to the appropriate C62 Standard. The Rotating Machinery Subcommittee and the PSRC Officers approved this course of action.

J6: PERFORMANCE OF GENERATOR PROTECTION DURING SYSTEM DISTURBANCES

Chairman: S. Patel

Vice-Chairman: K. Stephan

Established: 1998

Output: Transaction Paper

Expected Completion Date: 2001

Status: Forming Draft 0

The WG met with 10 members and 18 guests. Four writing assignments received since the September meeting were discussed.

The WG members were requested to submit one new and two outstanding writing assignment prior to February 15, 2000.

The WG expects to complete Draft #0 of the transaction paper and mail it to the WG members prior to March 31, 2000.

J7: REVISION OF GUIDE FOR GENERATOR GROUND PROTECTION GUIDE

Chairman: J.T. Uchiyama

Vice-Chairman: R. Das

Established: 2000

Output: Standard Revision IEEE C37.102-1987

Expected Completion Date: 2004

Status: New Working Group being formed

The WG had its first meeting with 15 members and 7 guests.

The Chair discussed the results of the major negative comments from the recent reaffirmation ballot. All sections of the present document are to be reviewed by the 14 assigned groups of the WG. The chair will obtain an electronic copy of the present document and forward it to the WG members. All assignments are due to the chair by April 15, 2000.

Liaison Reports

1. Electric Machinery Committee: C.J. Mozina.

No report given.

Coordination Reports

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

No report given.

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

No report given.

3. **C50.41, ANSI Standard for Polyphase Induction Motors for Power Generating Stations: R. Pettigrew.**

No report given.

4. **P1010, Guide for Control of Hydroelectric Power Plants: Wayne Hartmann.**

The P1010 group is in the process of their 5 year review of this guide. The coordinating contact is John Hale.

After two meetings to decide on the scope of their revision efforts, the WG has decided to make a major revision of the entire document. A special task force has been created to review aspects of P1010 that are redundant and out dated in terms of protection information with the existing (PSRC sponsored) Standards and Guides. The WG will attend a special meeting in February 2000 to work on the Guide in preparation for review at the Summer Power. PSRC coordination if needed has been planned for prior to the Summer Power meeting.

Old Business

No old business was taken up.

New Business

New Member, Kevin Stephan, agreed to join the Subcommittee.

K: SUBSTATION PROTECTION SUBCOMMITTEE

Chair: C. F. Henville

Vice Chair: S. R. Chano

The Subcommittee met on January 12, 2000, with 19 members and 28 guests present. The minutes of the previous meeting in Louisville KC were approved with no modifications.

Working Group Reports

K1: PROTECTION OF PHASE ANGLE REGULATING TRANSFORMERS

Chair: Mohamed Ibrahim

Vice Chair: Frank Plumtre

Established, 1999

Expected Completion Date: 2000

Output: Summary Paper

The WG met for one session with 9 members and 5 guests attending. The group is now preparing a summary paper of the special publication. Assignments were reviewed and a final draft of the summary paper to be ready by mid-February 2000. The WG proposes to ballot the subcommittee in time to review ballots during the May 2000 PSRC meeting. K1 special publication is now available on the PSRC Web page.

K2: TRANSFORMER PROTECTION GUIDE

Chair: R. Hedding

Vice Chair: R.W. Haas

Established: 1991

Expected Completion Date: 1999

Output: Revision of Standard ANSI C37.91 Ballot re-circulation-Draft 13

The working group did not meet Wednesday morning as the preliminary guide ,draft 13 was sent to RevCom for approval as the results of the re-ballot came back with no negative ballots . It's expected that RevCom approve this document at their 1/30 /00 meeting. Depending on the outcome of Revcom we may or may not need a meeting room for the May meeting

K3: TRANSFORMER THERMAL OVERLOAD PROTECTION

Chair: Glenn Swift

Vice Chair: S. Zocholl

Established 1995

Expected Completion Date: 1999

Output: Transactions paper Draft 3A

Seven members and 14 guests attended the meeting. In September and October of 1999 the Substation Protection Subcommittee had voted on the IEEE Transactions Paper prepared by the Working Group. There were 18 Approved votes, 6 Approved with Comments, zero Not Approved, 1 Abstention, and 8 no responses. The six sets of comments were discussed and resolved. The paper will now be "deconstructed" in accordance with complex PES Transaction Paper submission rules and submitted. Charlie Henville suggested a possible general presentation of the paper at a subsequent PSRC meeting. The members present agreed that the Working Group should now be disbanded if the Subcommittee agrees. The Subcommittee did agree to disband the working group, with thanks to the present and past chairs.

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: 2000

The WG met with 7 members and 12 guests. Clause 3.5, CT selection, was discussed and Walt Elmore and Stan Zocholl agreed to collaborate on modifying the clause. Items to be included are specific direction to the reader as to what percent slope is assumed as well as a clarification of how to use the table 1. Bogdan Kasztenny will revise his input to clauses 4.1.3 to discuss the methods used to determine the magnitude of restraining current. The changes are due to the chair by 2/15/00. Draft #15 will be sent to the WG members and the IEEE. The chair will request a balloting body to be formed. Dr. Kasztenny was added to the WG.

K5: NETWORK TRANSFORMER PROTECTION GUIDE

Chair: C. R. Sufana

Vice Chair: J. J. Horwath

Established, 1994

Output: Revision of Standard ANSI C37.108

Expected Completion Date: 2000

Draft ballot

Working Group K5 met in a single session with 6 members and 14 guests present. Draft 8 of the document was discussed specifically the reference clause. NEMA references will be

moved to the Bibliography section. The main topic of discussion was IEEE P1547 Std. Draft 2 on Distributed Resources Interconnected with Electric Power Systems, clause 3.1.1.4, Distributed RESSOURCES ON Distribution Networks. The concern is that there should be no discrepancies between P1547 and PC37-108. An abstract and keyword clause will be developed for the document. All WG members are to review P1547, clause 3.1.1.4 and R. Landman's comment by January 19, 2000.

K6: SHUNT CAPACITOR PROTECTION GUIDE

Chair: G. Fenner

Vice Chair: S. R. Chano

Established, 1994

Expected Completion Date: 2000

Output: Revision of Standard ANSI C37.99 Draft 10(Final)

The WG held one joint session with the T&D Capacitor Subcommittee. The status of C37.99 was reviewed during the meeting. The document was re-circulated and all negative ballots were resolved. Draft 10 has been submitted as a word document to THE Standards Board for final approval and should be reviewed in Singapore. The WG should not be disbanded until the Standards Board approves it. 7 members and 16 guests attended the meeting.

K7: GUIDE FOR THE PROTECTION OF SHUNT REACTORS

Chair: K. A. Stephan

Vice Chair: P. G. Mysore

Established, 1999

Expected Completion date: 2002

Output: Revision of ANSI/IEEE C37.109.

The WG did not meet at San Diego. A task force of 9 members and 7 guests met instead. Our PAR has been submitted to the Standards Board and it will be voted upon during their meeting January 30, 2000. The task force reviewed and discussed five writing assignments received prior to this meeting. There was considerable discussion about bypassing neutral reactors with high-speed switches, failures of neutral reactors, the advantages of microprocessor relays in terms of filtering out non-fundamental frequencies, directional overcurrent relaying with special polarizing for improved turn-to-turn fault protection, effective grounding issues, protection of oil-immersed reactors equipped with auxiliary power windings, and considerations for shunt reactors used on series-compensated lines. The WG plans to have Draft 0 of the new guide ready after the PAR is approved and before the May 2000 meeting.

K8: GUIDE FOR PROTECTIVE RELAYING OF UTILITY CONSUMER INTERFACE.

Chair: Irwin Hasenwinkle

Vice Chair: Fred Griffin

Expected Completion Date: 2000

Output: Revision of ANSI Standard C37.95 (Draft 8)

The WG met 4 members and 7 guests present. The Chairman reported the following results of the September, 1999 Ballot: Balloting Group =76, Affirmative Votes =61, Negative Votes =2, Abstentions =2, Ballots returned =65. The guide passed with 96% of the ballots cast. One negative vote has been resolved and the WG continues efforts to resolve the remaining negative ballot. This has been hampered because of a job change. 17 of the affirmative votes included comments. These were incorporated into draft 8 and comments of the Substance discussed during the meeting. Several minor changes were added during the meeting. The changes will be included in a final document which will be re-circulated before the May meeting.

.K10: SCC21 Distributed Resources Standard Co-ordination (Ex KTF1)

Chair: William Feero

Vice Chair: Doug Dawson

Established, 1999

Expected Completion Date: 2001

Output: Standard Through the SCC 21

Five members and 14 guests attended the meeting. Dough Dawson, Vice Chair, led the discussion in the absence of Bill Feero. The Chair reported on the current status and plans of SCC21's project P1547, Standard for Distributed Ressources Interconnected with Electric Power Systems. Copies of the P1547 year 2000 meeting schedule and the location of the P1547 web site were handed out. The Working Group had a lengthy discussion of the high level of interest in P1547 concerning the interconnection of Distributed Resources on Secondary Network Systems. A discussion was held on a letter from J.L. Koepfinger expressing concern over utilities use of the undefined term "Utility Grade Relay" and the adequacy of IEEE Std. C37.90.1 to represent the surge environment at Distributed Resource Facilities. The consensus of the group was that P1547 should continue to avoid the term "Utility Grade", but should instead refer to appropriate IEEE and IEC Standards to indicate the performance and features required. It was noted that it is convenient to have a single term, like "Utility Grade", to refer to relays having high performance Characteristics and features. The Working Group would like to solicit the opinion of the PSRC as to whether such a term could be defined. Ljubomir Kujovic asked to become a member of the Working Group.

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

Chair: A. F. Elneweih

Vice Chair: F. P. Plumtre

Established, 1999

Expected Completion Date: 2003

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

The Working Group met in two sessions with 12 members and 20 guests in attendance. Guests included Chair and some members of T&D Series Capacitors Standards WG. The Chair informed the WG that the IEEE Standards Board approved the PAR. Extensive discussions took place on subjects to be included or deleted from the existing PSRC Special Publication without infringing on the responsibilities of the T&D Group. In general, there was a very good agreement between the T&D and PSRC Working Group members. Assignments were given to prepare an outline for the guide. When prepared, the proposed outline will be sent to the members for comments. Assignments will then be given for the May meeting.

Liaison Reports

- 1. Transformer Committee: J.D. Huddleston III.** Nothing new to report. Although the committee had its meeting in Monterey, Mexico on November 7-10, 1999. The minutes from New Orleans in April 1999 are the latest available.

Coordination Reports

1. ANSI/IEEE Switchgear Standards: F Plumptre.

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

Document in publishing stage - nothing to report after discussion with chairman.

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

Task Force Reports were discussed IE: These reports review pertinent sections of IEC 694 in considering changes to C37.100.1

Design Test Task Force - Further work needed in the area of dielectric testing

Production Task Force - Some clauses too restrictive, opted not to use some from IEC 694

Design & Construction Task Force - Liaison between IEEE and IEC difficult i.e.: obtaining IEC drafts/documents at reasonable cost.

Ratings Task Force - Preferred ratings stated, other rating acceptable so as not to disenfranchise manufacturers who have been manufacturing equipment to values other than the standard.

Service Conditions Task Force - continuing discussions on altitude correction factors.

2. ANSI/IEEE Standard C37.20.2 Standard for Metal-Clad Switchgear: C. F. Henville.

The balloted Draft 8 was approved by the SA Revisions Committee conditional to the sponsor verifying that rebuttals to unresolved negative comments were circulated to the

balloting group. The unresolved negative comments were indeed circulated to the balloting group; so this standard is now approved. It is recommended that this co-ordination item be removed from future Subcommittee agendas.

3. **Transformer Committee, Project C57.119, Recommended Practice for Performing Temperature Tests on Oil Immersed Power Transformers at Loads Beyond Nameplate Rating: J.E. Stephens.** No report. Not yet in Standards Catalog.
4. **PC62.91-SPD, Revision of IEEE 32 Requirements, Terminology, and Test Procedures for Neutral Grounding Devices: D. C. Dawson.** Technical input from the Transformers Committee has been received. Balloting is planned to take place in year 2000.
5. **C37.66 Requirements for Capacitor Switches for Ac Systems: S R Chano.** Nothing is reported. Simon Chano will contact T&D Capacitor Committee to verify the activities of C37.99. are taking place.
6. **P1375 Guide for the Protection of Large Stationary Battery Systems: T. E. Weidman.** Nothing is reported
7. **C57.12.01 General Requirements for Dry-Type Distribution and Power Transformers Including Those with Solid Cast and/or Resin Encapsulated Windings: J. D. Huddleston III.** The latest draft was published, but not yet sent to the WG members by IEEE. The WG has a new approved PAR and is starting on the review for the next revision.
8. **P1538 (When approved) Guide for Determination of Maximum Winding Temperature Rise in Liquid Filled Transformers: Dan Hollands.** Nothing is reported
9. **P1409 Guide for Application of Power Electronics for Power Quality Improvements on Distribution Systems Rated 1 kV through 38 kV: Steve Conrad.** Nothing is reported.

Old Business

None

New Business

Co-ordination with Switchgear Committee: 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. was requested. Roger Hedding will be the coordinator for PC 37.74.

A formal request will be sent to the Chair of T&D WG for IEEE 824 to assure co-ordination between the PSRC and this WG.

The possibility of starting work on a standard or guide for the protection of phase angle regulating transformers was briefly discussed. Further consideration of this item was deferred until after WG K1 has completed the summary paper of the special publication it has prepared.