POWER SYSTEM RELAYING COMMITTEE

OF THE

IEEE POWER ENGINEERING SOCIETY

MINUTES OF THE MEETING

SEPTEMBER 13-16, 1999

LOUISVILLE, KY

POWER SYSTEM RELAYING COMMITTEE
MAIN COMMITTEE MEETING

Louisville, KY
Thursday, September 16, 1999

I. CALL TO ORDER — Arun Phadke, Chairman

II. APPROVAL OF MINUTES — Rick Taylor, Secretary

The minutes of the Las Vegas meeting were approved following minor revisions.

III. FINANCIAL REPORT — Rick Taylor, Secretary

The financial report is available upon request from Rick Taylor.

IV. REPORTS OF INTEREST

A. PSRC Technical Paper Coordinator's Report — George Nail

The Summer Power Meeting in Edmonton was fairly well attended by the members of the PSRC. We had two Paper Sessions with a total of seven papers. The Panel Session headed by Dennis Holstein was very interesting and a portion of it was also presented again at this meeting. I thought Dennis Holstein, John Tengdin, Eric Udren and Alex Apostolov did a great job with the panel session. The Winter Power Meeting in January 2000 will have a Panel Session chaired by Mladen Kezunovic. The session is titled "Intelligent Systems in Protection Engineering". In addition to the panel session there will be six Paper Sessions with 43 papers scheduled so far. This is a staggering number and we are all interested to see how it works out.

B. Power Engineering Society Report — Gary Michel

Nothing to report.

C. Cigre — Chuck Mozina

The next meeting of Study Committee 34 (Power System Protection & Local Control) will be held in Florence, Italy on October 11-15, 1999. Twelve U.S. relay engineers plan to attend this conference. A total of thirteen papers were accepted by the organizing committee from U.S. authors on the following preferential subjects:

Preferential Subject #1	Allocation and grouping of functions in integrated protection and control systems—experience and trends.
Preferential Subject #2	Fault location and system restoration.
Preferential Subject #3	Test guidelines for numerical (digital) relays.

On June 7-9, 1999, CIGRE held a symposium in London entitled "Working Plant and System Harder". It was attended by over 230 utility engineers worldwide. Subjects included:

- Dynamic rating of equipment
- Exploiting plant capabilities
- Developments of system operational planning and control techniques

- Investment planning and new technologies
- Maintenance strategies
- Exploiting subtransmission systems

Chuck Mozina chaired Session 2 on exploiting plant capabilities. Contact Chuck Mozina for papers presented at the symposium.

D. EPRI **Jerry Melcher**

No written report.

E. IEC Report **Eric Udren**

TC 95 RELAY STANDARDS

The US Technical Advisory Group for TC 95 has two working documents before it for vote and comment:

1. 95/81/CD (Committee Draft):

Revision of 60255-3, Single-Input Measuring Relays with Dependent or Independent Time. IEC WG 10 is developing this standard based on IEEE C37.111 on inverse time-overcurrent curves. Stan Zocholl is the convenor of the international WG. There are some updates from the IEEE document, notably in the reset and testing areas. The old IEC curves are now listed as A, B, C as before; the three standard IEEE curves are listed as D, E, F. A positive vote is planned.

2. **95/82/NP (New work proposal):**

Surge Immunity Test. This new surge test is proposed as a supplement to the impulse voltage insulation test already in IEC 60255-5. It uses a test generator from generic IEC environmental test standard 61000-4-5 to yield higher peak currents than the insulation test, and the relay must be in an operating state. The intent is to verify the energy-absorbing capacity of MOVs used to protect input circuits, and to show that the relay will not trip when exposed to a lightning-like slow surge of 1.2 microseconds rise time and 50 microseconds decay. Because of the large number of test shots specified and the cooling time between shots, the test takes days to run on one relay. The WG felt that the new test is a severe burden of time and effort, not based on any recognized need. The needed additional surge survival testing, if needed, should be incorporated in a revision of IEC 60255-5. The IEC or IEEE oscillatory burst surge test already does a good job of demonstrating that an operating relay is secure in the presence of even more intense surges having frequency components in the same range.

The US plans to vote against this new project. The WG members seek any outside information on failures of MOVs or other components in recent relay designs from such surges - there is no general awareness of any problem. It is frustrating to note here the *one nation - one vote* principle of IEC standards, with no regard to size or economic impact. If the US is opposed and Finland is in favor, the two cancel out!

The TAG has found it difficult to coordinate standards between the IEEE and the IEC, even when the US proposes and chairs the work. In the cases of C37.111 and 60255-3, the IEC work followed the US work and the result is that the IEC work is the more current document, not at all identical. In the case of COMTRADE discussed at the last PSRC meeting, the US revision work and the IEC work went on in parallel. The separated voting cycles produce mutual interference and make it difficult to reach a common result. It was

necessary for the US to cast a negative vote on the CD for the work it sponsored, in order to enable incorporation of the most recent changes in the PSRC COMTRADE draft. It is not certain that the rest of the IEC voting nations will accept these changes - the iterative voting cycles can go on for a long time to achieve convergence.

TC 57 SUBSTATION CONTROL AND COMMUNICATIONS STANDARDS

TC 57 WG 10, 11, 12 met in Seattle in July to process comments received from voting nations on Committee Drafts (CDs) of four key protocol and architecture definition sections of IEC 61850, Communications Networks and Systems in Substations. This work is far from done - major rewrites of these core protocol definition sections are underway. The US delegation, representing IEEE and EPRI UCA, is still working to get the WGs to converge UCA and IEC protocol details so the industry winds up with a single international standard for substation data communications.

Separately, WG 12 issued a CD for a simplified Ethernet-based unidirectional serial data link for communicating streaming sampled data from switchyard sources to relays and IEDs in the control house which process the data. This is a practical switchyard data acquisition solution which could be used in the near term. This activity is overseen in PSRC HTF1. The US made comments focused on addition of status information with useful quality indication, and other detailed changes. The next meeting of these WGs is November 8-11 in Berlin.

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/guides/.

Starting in mid-2000 Jeff McElray will be taking over as Standards Coordinator. We will try to make this an easy transistion for all.

Standard Boards Activity

1. PARs to be submitted:
   - PC37.117 Guide for the Application of Protective Relays Used for Abnormal Frequency Load Shedding and Restoration
2. PAR Submittals (January 2000)
   - 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
   - PC37.90.1 Standard for Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems
5. PAR Extensions
   - PC37.90 Standard for Relays and Relay Systems Associated with Electrical Power Apparatus
6. PAR Withdrawals

- None

7. Balloting Bodies requested
   - PC37.104 Guide fro Automatic Reclosing of Line Circuit Breakers for AC Distribution and Transmission Lines.
8. Balloting Bodies formed (waiting for Projects to be submitted)
   - PC37.106 Revision to Guide for Abnormal Frequency Protection for Power Generating Plants
   - PC37.90.3 Standard Electrostatic Discharge Tests for Protective Relays
9. Standards in Balloting Process
   - 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)
   - PC37.91 Transformer Protection Guide (To be re-circulated)
   - 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.
   -
10. Standards Submitted to Standards Board
    - 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)
11. Standard Approvals
    - C37.113 Guide for Protective Relay Applications of Transmissions Lines
12. Standard Extensions
    - C37.91 Guide for Protective Relay Applications to Power Transformers, June 1999
13. 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
14. Reaffirmations needed
    - None
15. Reaffirmations granted
    - C37.93 Guide for Power System Protective Relay Applications of Audio Tones over Telephone Channels
16. Standards Withdrawn
    - None

Standards Board Meeting Schedule:

PAR/Standard Submittal Deadline	Standards Board Meeting
Late April	13-26 June - Boston
Early August	14-16 September - Piscataway
Late October	7-9 December - NYC or Piscataway, NJ

G. Substations Committee Report **John Tengdin**

This report is submitted on behalf of James W. Evans, who chairs Substations Data Acquisition and Control Subcommittee C0.

This joint meeting was a continuation of the tradition of a Fall joint meeting of PSRC and Substations C0 and its Working Groups and Task Forces. This tradition began in 1992.

The C0 WGs and TFs met on Sunday and Monday in work sessions on standards. The effort is to update two existing standards and create one new standard. Updates are underway on the SCADA standard C37.1 to recognize systems with predominantly IEDs as data sources. The new title will be "Standard for SCADA and Automation Systems." The current standard 1379 "Trial Use Recommended Practice for RTU to IED Communications" is being updated to a full five year recommended practice (deleting the words "Trial Use" in the title. The PAR has been approved. The task force (C3TF1) is targeting to complete the update and have a document ready for review at the January 2000 meeting. A new standard, P1525, is being created to take the EPRI report RP3599 to an IEEE standard for substation communications.

The next meeting of C0, its Working Groups and Task Forces will again be joint with PSRC in January 2000.

V. SUBCOMMITTEE REPORTS

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

VI. Old Business

Nothing to report in these minutes.

VII. New Business

Nothing to report.

FUTURE MEETING LOCATIONS AND DATES:

September 13 - 16, 1999	Louisville, Kentucky	The Camberly Brown Hotel
January 10 - 13, 2000	San Diego, California	Mission Valley Hilton
May 8 - 11, 2000	Grand Rapids, Michigan	Amway Plaza Hotel
September 11 - 14, 2000	Andover, Massachusetts	Rolling Green Inn
January 8 - 11, 2001	Austin, Texas	Hilton - Austin North
May 21 - 24, 2001	Vancouver, BC, Canada	The Empire Landmark

B: ADVISORY COMMITTEE

Chair: A.G. Phadke
Vice Chair: G.R. Nail
September 14, 1999 Meeting

Expected Completion Date: Continuous
The Administrative Committee recommended that Ken Fodero, Wayne Hartmann and George Moskos be invited to join the Main Committee of PSRC. We welcome these new members to our committee.

The Long Range Planning Working Group reported that the Millennium Book being readied for the PSRC meeting in San Diego is in its final revision, and will be at the printers in the coming months. We will distribute this book to all who attend that meeting, and mail complimentary copies of the book to several individuals who might have an interest in knowing the history and accomplishments of the PSRC.

The Long Range Planning Working Group also recommended (to Don Russell) a list of papers to be included in the PES publication which will be issued some time in the year 2000. It is to include Power Engineering papers which have been influential in our field, and have guided significant developments in electric power engineering.

IEEE is also going to award Millennium medals to several outstanding engineers. PES has been assigned a quota for power engineers, and based upon recommendations received from different Technical Committees and several individuals, the President of PES (Don Russell) will forward the PES quota nominations to IEEE.

PES is going forward with plans for electronic reviews and eventually electronic publication of our papers. Transactions papers are already being submitted in electronic form.

The Substations Committee is going to hold their January meeting with us in San Diego, as most of their members will not be going to the Winter Power Meeting in Singapore. We will welcome our colleagues from that Committee in San Diego.

Jeff McElray will take over as our Standards Coordinator beginning in the summer of 2000. Miriam Sanders has done an outstanding job for us in this capacity, and our special thanks to her for a job well done. She will be working with Jeff from now until next summer.

It is time again to reiterate that the PSRC very strongly discourages even a hint of commercialism at any of our Working Group, Sub Committee, or Main Committee meetings. We must be ever vigilant that our meetings do not become vehicles for commercial activities.

B1: AWARDS AND TECHNICAL PAPER RECOGNITION
Chair: M.S. Simon
Vice Chair: B. Nelson
Output: Review &Recommend PSRC Publications
Expected Completion Date: Continuous

The Awards and Paper Recognition WG met to finalize the process and timelines for selecting nominees for the following prizes and awards:

Prize Paper
Working Group Technical Report
IEEE Standard or Guide
High Interest Paper
Alfred Noble Intersociety Award

PSRC Career and Distinguished Service Awards

Leadership of the Awards WG will change at the next meeting in January. The vice-chairman will be Damir Novosel and the acting chairman will be Brad Nelson.

B2: FELLOWS AWARDS
Chair: J.S. Thorp
Output: Review Fellow Nominations
Expected Completion Date: Continuous

B2 Fellows Awards Working Group did not meet.

B3: MEMBERSHIP COMMITTEE
Chair: M. Swanson
Output: Improve PSRC Participation
Expected Completion Date: Continuous

WG B3 (Membership) met with Arun Phadke on September 14 to gain approval for the annual membership and the continuing computer education plans. The WG also helped with the newcomers meeting on Tuesday.

Immediate action steps scheduled for the next three months include gathering statistics on 1999 attendance, contacting new attendees, run a survey on computer education subject preferences, and prepare to teach HTML during next meeting's Stump the Experts session.

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

Chair: J. Appleyard

Vice Chair: M. Swanson
Output: Update O/P Manual
Expected Completion Date: Continuous

Nothing to report.

B8: BIBLIOGRAPHY AND PUBLICITY
Chair: T.S. Sidhu
Output: Transactions Paper
Expected Completion Date: Continuous

The working group met with six members present. The 1998 bibliography paper has been submitted to the PES office for publication in the IEEE Transactions on Power Delivery. A copy of this paper has also been given to Jim Thorp and Arun Phadke. Preparation of the 1999 paper is progressing. Jeff Burnworth is continuing his work for updating the Relay Engineers' Mailing List. A report highlighting the 1999 activities of the PSRC has been prepared by Jim Stephens. The WG accepted the report with minor changes.

B9: PSRC WEB SITE
Chair: M.S. Sachdev
Output: Web Sites
Expected Completion Date: Continuous

Assignment: 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.

The Working Group did not meet in Louisville. A meeting is planned for the January 2000 meeting in San Diego. The preliminary assignment listed in the previous paragraph will be considered for approval.

The PSRC Web site is operational at this time. A new URL will be registered soon. The address of the PSRC Web site will change to the following when the new domain name becomes effective.

http://www.pes-psrc.org

The addresses of the Subcommittee Web sites will change to the following form.

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/

These sites can be reached either by using their URLs 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.

The PSRC Web site includes the following pages

- Scope of the PSRC,
- Future meetings,
- Bulletins,
- Minutes of three most-recent meetings of the PSRC,
- Report on standards activities
- Agenda of the upcoming meeting,
- Email addresses of members,
- Links to Subcommittee Web sites and
- Links to other organizations.

The information on future meetings includes the dates, location and URLs of the hotels and cities where the meetings will be held.

One of the objectives at this time is to stream line the placing of important information on the Web in a timely manner.

Three issues are being considered for expanding the Web site. The first issue is to place the names and photographs of all PSRC participants on the Web site. The second issue is to include a registration form for the future meetings on the PSRC Web sites so that the members may register via the Web.

C: System Protection Subcommittee
Chair: J. S. Thorp, Chair
Vice Chair: D. Novosel, Vice-Chair

The System Protection Subcommittee met on September15, 1999 with 14 members and 16 guests in attendance.

C1: SOFTWARE MODELS FOR RELAYS
Chair: P. G. McLaren
Vice Chair: K. K. Mustaphi
Established: 1995
Output: IEEE Transactions Paper
Expected Completion Date: 1999

The WG met did not meet.

C3: NEW TECHNOLOGY RELATED TO TRANSMISSION AND DISTRIBUTION PROTECTION
Chair: A. P. Apostolov
Vice Chair: P. A. Solanics
Established: 1994
Output: Report to Main Committee and IEEE Transactions Paper
Expected Completion Date: 1999

WG met for a single session on September 14 with 14 members and 37 guests present.

Two topics were discussed by the working group:

- **Testing of Programmable Scheme Logic in Microprocessor Based Relays :** The discussions were related to testing methods, tools, requirements and reporting for PSL in relays.
- **Protection of Breaker-and-a-Half and Ring-Bus Configurations:** The discussion was related to the implementation of single device with multiple sets of current and voltage analog inputs that provides line/transformer protection plus breaker protection and control, versus individual devices providing breaker protection and control.

The next meeting in January 2000 will have one presentation by Barry Jackson, Duke Power and discussions on Protection Functions in Substation Integration Systems.

C6 :Wide Area protection and emergency control
Chair: Miroslav Begovic
Vice Chair: Damir Novosel
Established, 1996
Expected Completion Date: 2000

The Working Group met on September 14 in a single session with 10 members and 8 guests in attendance.

Our member, Ken Martin, gave a presentation on implementation of the phasor measurement system in BPA, and provided very interesting information about the data communication and other implementation aspects.

There was some discussion on the current draft of the report. It was agreed that additional information about existing SPS be provided in the report. Some assignments were made for continuation of the work on WG report.'

C7 :EMTP Applications to Power System Protection
Demetrios Tziouvaras, Chair
Lubomir Kojovic, Vice Chair
Established, 1997
Expected Completion Date: 1999

The WG met did not meet.

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 1:30 PM on September 14. Four members and Eight guests were present.

The Minutes of the WG meeting held on May 12, 1999 in Albuquerque, NM distributed by Email were approved.

Five writing contributions submitted by the members were consolidated into a single document by Moh Sachdev to facilitate their review. The consolidated document was distributed by Email to the members of the Working Group before the meeting and copies were made available at the meeting.

The document was reviewed and it was suggested that Section III.B.3 (Model Implementation) should be rewritten in a generic form to eliminate any perceived commercial endorsement of MatLab. M. Begovic volunteered to rewrite this section in a generic form.

The WG also determined that it is necessary to review Section 3.1 (Phasor Measurement Methods) to ensure consistency of content. This review was assigned to Moh Sachdev.

Writing of Sections I (Introduction) and Section II (Definitions) had not been assigned previously. Sam Sambasivan and Liancheng Wang were asssigned the writing of Section I (Introduction).

Writing of Section II (Definitions) was assigned to Alex Apostolov.

Sam Sambasivn and Liancheng Wang joined the the Working Group.

C9 : A Guide for aPPLICATIONS of UNDERFREQUENCY LOAD-SHEDDING and restoration
Alex Apostolov, Chair
Ken Behrendt, Vice Chair
Established, 1999
Expected Completion Date: 2002
Output: Guide

The working group met on Tuesday, September 14th, with 14 members and 16 guests present. The working group reviewed the guide's title, scope and purpose that was developed and agreed upon at the last meeting. Attention then focused on developing an outline for the guide. A proposed outline was drafted and initial writing assignments were made to cover the outlined

material. An informal survey of UF load shedding and load restoration methods will be performed within the working group to help gather material for the guide.

The scheduled completion date remains December, 2001. The working group expects to meet in single session at the next PSRC meeting, and needs a room for 30 with an overhead projector.

C10: Effects of Changing Utility Environment on Protective Relaying
Jamie de la Ree, Chair
Tefvik Sezi, Vice Chair
Established, 1999
Expected Completion Date: 2003
Output: Transactions Paper

The working group met on with 5 members and 11 guests present. As Chairman, De La Ree, was absent, Vice-chairman held the meeting. Actions from the meeting are:

1. Assignment is changed to: “Effects of Changing Utility Environment on Protective Relaying”
2. Tefvik Sezi will write a summary of the discussion, as a “start-up” of the paper.

Next meeting: 20-25 attendants. Single session

LIASON REPORTS:

IEEE Working Group on Power System Dynamics Measurements, G. Michel

The Working Group met Monday, July 19, 1999 at the IEEE/PES 1999 Summer Power Meeting in Edmonton, Alberta, Canada immediately after a Panel Session it sponsored entitled "Power System Dynamic Performance Monitoring for Operation, Protection, and Planning." The Panel Session was well attended. The panel material is in the Conference Proceedings, Volume 1, under the conference theme: "Reliability Management in the New Environment, Track 1.

After a brief update of recent activities, the Working Group agreed that the purpose of present and past panel sessions of providing a common understanding of the state of development of monitoring technology and applications have been met. No additional panel sessions are planned. The Working Group agreed to develop a set of preferred capabilities for Power System Dynamics Monitors. This work is not intended to be a standard. It will describe monitoring experience.

The Working Group will not meet at the PES Winter Meeting in Singapore.

The next Working Group Meeting will be July, 2000 at the IEEE PES SPM in Seattle, Washington.

NERC Engineering Committee, Phillip B. Winston

The Planning Standards implementation procedure is in process.

T&D Committee, M. Kezunovic

No report.

D: LINE PROTECTION SUBCOMMITTEE
Chair: R.M. Westfall
Vice Chair: Mark Carpenter

The Line Protection Subcommittee met in Louisville on September 15, 1999 with 16 members and 14 guests present and Vice Chairman Mark Carpenter. The minutes of the Albuquerque meeting were approved.

D1: EFFECTIVENESS OF DISTRIBUTION PROTECTION
Chair: P. Carroll
Vice Chair: C. Fink
Established: 1994, Output: IEEE Paper
Expected Completion Date: 2000
Status: Draft #2

Working Group D1 met with 8 members and 13 guests. After introductions and approval of the May meeting minutes, Mike Meisinger gave a presentation entitled "High Speed Fault Sectionalizing for Underground Distribution Networks". The working group generated questions and discussed the relay protection and communication scheme presented. Thanks to Mike for his presentation. The WG Chairman is asking for anyone who would like to volunteer or has ideas for future meeting presentations to contact him. The meeting continued with a status report on the working group assignment. Presently, there are only a few minor revisions that need to be incorporated into the survey. Once this is done, it will be ready for mailout. Phil Winston informed the group that the updated mailing list is essentially complete and available for our use. John Zipp, Barry Jackson, Charlie Fink, and Patrick Carroll volunteered for survey disk copy and mailout assignments. The meeting concluded with group consensus that 3 weeks would be an appropriate response turnaround time.

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 September 14 with 12 members and 21 guests. Demetrios Tziouvaras gave a presentation of a paper entitled, "New Multi-Ended Fault Location Design for Two- or Three-Terminal Lines". This was another in a series of presentations on different aspects of fault locating. The next draft (Draft 4) is in the process of being completed. We have received favorable comments on the guide from several reviewers. We are also:

- Updating the guide according to the IEEE Style Manual;
- Soliciting inputs from those who have requested coordination.

Draft 4 is scheduled for distribution by October 31, 1999.

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 D-4, Automatic Reclosing, met on September 15, 1999 with 16 members and 12 guests attending, and Bill Strang presiding.

Draft 5 was distributed on August 18. Changes that were submitted before the meeting were discussed. Additional changes were also discussed. Only one of 4 sets of suggestions for changes from other coordinating committees was submitted. An appeal for the remaining coordinating committee changes was made.

October 22 is the deadline for additional changes to Draft 5. Balloting will be scheduled shortly thereafter.

D6: TRANSMISSION LINE PROTECTIVE SYSTEMS LOADABILITY
Chair: Tony Seegers
Vice Chair: J.B. Williams
Established: 1997, Output: IEEE transactions paper
Expected Completion Date: 2001
Status: New Working Group

Working Group D-6, Transmission Line Protective System Loadability, met on September 14, 1999 with 13 members and 9 guests. Prior to the meeting, Draft 3 was sent to members with comments from members being discussed. Sections were modified and others were assigned to members for rewrite and reorder. Under the present plan, a survey for comment from working group members is scheduled for after the January 2000 meeting.

D10: EMTP REFERENCE MODELS FOR TRANSMISSION LINE RELAY TESTING
Chair: K. Mustaphi
Vice Chair: T.Sidhu
Established: 1998, Output:
Expected Completion Date: 2001
Status: new working group

Working Group D-10 met with 6 members and 7 guests on September 14, 1999. Several members produced write-ups for the components to be used in the benchmark model. Elmo Price will write a description of the model with scenarios. The chairman will be able to develop Draft #1 now with all available materials by December 1, 1999. Also, members agreed that the document would be based on ATP version that is free and is available to the majority of the users.

D12: LINE PROTECTION GUIDE TUTORIAL
Chair: J. Zipp
Vice Chair: Elmo Price
Established: 1998, Output: Tutorial
Expected Completion Date: 2000
Status: new working group

Working Group D-12 met in on September 15, 1999 with 16 members and 23 guests. The working group reviewed the assignment and targeted output at the beginning of the meeting. Several options were discussed:

- Present IEEE tutorial with 4 or 5 associated papers,
- Present an 8 hour PSRC sponsored tutorial on line protection,
- Present a conference paper at a regional conference,
- Compile and publish a summary paper,
- Present a tutorial at the regional conferences.

As a result of the discussion, the following assignment is proposed:

“Make a 2-hour presentation at the next Texas A&M meeting and the next available Georgia Tech and Western Relay Conference. The purpose of the presentations will be to present the

D14 Line Protection Guide. A conference paper and an IEEE summary paper will also be produced."

A Presentation Editing Group was formed to develop and make the presentations to the conferences. Elmo Price, Mark Carpenter, George Parr, Roger Hedding, Tony Seegers, John Zipp, and Alex Apostolov volunteered to make up the group.

The group will use the available slides and excerpts from the guide to build the 2-hour presentation. Once the presentation is complete, the material will be used to produce a conference paper and then a summary paper.

The presentation will be in draft form for approval at the January 2000 meeting in San Diego.

The chairman reported that the working group web site was up and running. It is accessible through the PSRC Line Protection Subcommittee page.

D14: <u>TRANSMISSION LINE PROTECTION GUIDE</u>
Chair: W.M. Carpenter
Vice Chair: A.N. Darlington,
Established: 1992, Output: IEEE Guide
Expected Completion Date: 1999
Status: Approve by the IEEE-SA Standards Board

Working Group D14 did not meet in Louisville. The Guide for Protective Relay Applications to Transmission Lines was submitted to the IEEE offices for approval and publication on June 24, 1999. On Sept. 16, 1999 the IEEE-SA Standards Board approved PC37.113/D20 and forwarded it to the Standards Publication Department.

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**

   M. S. Sachdev reported that no activity in this area and it should be dropped as a liaison report.

Old Business:

There was no old business.

New Business:

John Tengdin reported that the T&D committee has a task force IEEE T & D TF on Protection and Control and suggests that because of the title that the Line Protection Subcommittee needed to establish communication to determine of coordination is appropriate. Vice Chairman Mark Carpenter agreed to investigate the concern.

General Discussion:

None.

High Impedance Fault Activity

Mark Carpenter made a brief presentation on a fault event that had both a high impedance fault and a low impedance fault that was not cleared due to trip coil failure in a circuit breaker.

H: RELAY COMMUNICATIONS SUBCOMMITTEE
Chair: M. G. Adamiak
Vice Chair: M. S. Simon

The Relay Communications Subcommittee met on September 15, 1999.

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 (to be produced by PSCC)
Expected Completion Date: 1999

The WG did not meet. Draft 6 of the WG assignment, incorporating comments and changes from the WG "consensus poll", has been distributed to the WG. The WG considers draft 6 of clauses 9 and 10 to be complete and ready for insertion into the overall guide revision. The rest of the guide is under revision by the PSCC Power-Line Carrier Subcommittee. When the PSCC is ready, the whole guide, including clauses 9 and 10 contributed by the PSRC, will be balloted following IEEE SA guidelines. This WG is "on-hold" until official balloting 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

The working group did not meet.

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 double session. Twenty-eight members and guests attended. The minutes were reviewed and accepted. The agenda was reviewed and accepted.

John Beatty, Chairman of WG H5, reviewed the status of application scenarios available from H5 that will be used by H4. Revision 9, which reflects the results of H5 discussions in Louisville, will be published in the near future. H5 plans to have a final report published by April 14, 2000.

H4 has adjusted their development schedule for C37.115 to accommodate H5's schedule. H4 will develop a series of Editor's Books that will be used for markup and coordination. Book 1 (Draft 1) is planned for the end of October 1999. Additional books will be developed to reflect review comments and recommendations. The final book (last draft) is planned for April 15, 2001, and will be used for electronic balloting. The purpose of seeking coordination beginning with Draft 1 is to avoid surprises and delays near the end of the project.

One of the application scenarios, "Synch Check to Close Breaker", was reviewed. The build-out for this scenario illustrates that about 40 hours is required for each scenario received from H5. H5 has 30 application scenarios, and the time required to build-out each scenario and review the build-out at the H4 meetings is prohibitive. Therefore, only a subset of H5's application scenarios will be included in the annexes as informative examples. The members were asked to recommend which scenarios should be included. All recommendations for changes to the scenario annexes must be submitted to the chairman by the end of September.

Dennis Holstein reviewed information access and sharing facilities for the WG, including the IEEE mail exploder operation. He has proposed the use of AOL Instant Messenger (free software) to support WG chat meetings to resolve specific issues. He discussed efforts to have IEEE provide an Internet Location System (ILS) facility to host Microsoft NetMeeting. NetMeeting provides the capability to exchange of diagrams, as well as to conduct discussion in a large group. Dennis received an EMAIL from Luigi Napoli, IEEE, stating that no budget is available for an ILS facility at this time. Dennis asked the members of H4 to ask their IT departments if they have ILS facility that could be used for H4 NetMeeting. The members will check the availability, and if available, will notify the H4 chairman.

Jeff McElray submitted recommended changes to the Glossary containing definitions and acronyms. The members were asked to review Jeff's recommendations, and submit any changes to the chairman by the end of September. Furthermore, the members concluded that all definitions found in IEEE STD 100, should not be repeated, and the standard should be added as a normative reference.

Coordination with related parallel developments in the IEEE, IEC and Cigre were discussed. There is no formal coordination with IEC and Cigre, but the PC37.115 documents can be submitted informally to the TC57 WG10, 11 and 12 Joint Task Force on Scenarios for their review and comment. Dennis Holstein, PSRC's representative to IEEE SCC 36, stated that SCC36 is listed on the PC37.115 approved PAR for coordination. SCC36 does have a formal relationship with TC57 for reviewing Substation Automation communication system standards.

H5: <u>Application of Substation Peer to Peer Communications</u>
Chair: J. Beattv
Vice Chair: M. Yalla
Output: Paper
Expected Completion Date: 1999

At the Louisville meetings, Communications Subcommittee H - Working Group H5 (WG H5) met in double sessions on September 14 and 15, 1999.

- A total of 30 Members and Guests attended the two working sessions. Six new persons were added to the guest list. Several international guests were present.
- Members and Guests were introduced. The Minutes from the Las Vegas meeting were accepted as recorded in the PSRC Web site.
- Several members were noted as unable to attend this meeting: Murty Yalla, WG H5 Vice-Chairman and others (threat from Hurricane Floyd) and Mason Clark (surgeries).

- An update of the active member list for the 2000 Member Directory was made and transmitted to Mark Simon, Subcommittee H, Vice Chairman as requested.
- The WG H5 Draft Document was discussed, corrected, and updated from input after extended Author / Reviewer breakout sessions. Several authors submitted document subsection revisions updates in the days just prior to the meeting. Alex Apostolov indicated his second and final subsection contribution is to be submitted in the next week. Eric Udren indicated his revision would be available shortly. All these revisions will be added to the draft document for an expedited review.
- WG H4 Chairman Dennis Holstein presented examples of their build out of Annex documentation prepared from several H5 WG subsections. WG H4 will use these Annexes to start their "Book One" document in the next several weeks. Final WG H5 comments for "Book One" were requested by end of September. Additional WG H5 subsections will be included in WG H4 "Book Two" later.
- The revised WG H5 Document Schedule Dates are as follows:

  REVISED WG H5 SCHEDULE DATES:
  8/03/1999 = ALL H5 DOCUMENT SECTIONS WRITTEN – READY FOR FIRST REVIEW - SUBMIT DRAFT DOCUMENT TO WG H4
  9/03/1999 = FIRST REVIEWS FINISHED – SUBMIT REVISED DRAFT DOCUMENT TO WG H4
  9/13/1999 = FEEDBACK FROM WG H4
  ……
  9/30/1999 = WG H5 FINAL INPUT TO WG H4 "BOOK ONE" ANNEXES
  12/1/1999 = H5 DOCUMENT REVIEWS COMPLETE
  1/1/2000 = H5 DOCUMENT UPDATE FOR SAN DIEGO MEETING
  2/1/2000 = H5 REPORT FINAL REPORT COMPLETE
  4/1/2000 = H5 REPORT READY FOR PUBLICATION

H6: SUBSTATION ETHERNET LAN COMMUNICATION FOR PROTECTION
Chairman: John Burger
Vice Chairman: Charlie Sufana
Output: Special Report
Established: 1999
Expected Completion Date: 2003

HTF2 met in a single session meeting with 20 members and 19 guests and one member on 'vacation'. John Burger handed out several UCA2 related papers including GOMSFE .9 and the Albuquerque minutes were reviewed and approved. Discussions centered on the wording for a proposed PAR that we circulated. Several wording changes were reviewed and it was decided to change the language to reflect the group would select the UCA fully compliant protocol'. There was much discussion as to whether the final product of the group should be a standard, guide a special publication or a report. It was decided to approach the sub-committee with a proposal to develop a special report. We felt that a special report could be turned into one of the other, above categories, as required, at a latter date.

The special report will be titled 'Application of Substation Ethernet Local Area Network Communications for Protection and Control'.

Scope: This work will focus on user requirements and provide recommendations for relay peer-to-peer communications in substations. The work of HTF2 will further develop and define practices for the application and testing of MMS/TP4/ethernet protocol in substation LAN, peer-to-peer applications. The communications profile we are concerned with is based on using the UCA2 suite of standard protocols with a full seven layer OSI protocol stack. The UCA2

profile is MMS for the application layer with Ethernet as the data link and physical layers. TP-4 was selected for the network and transport layers of the OSI stack. The LAN is IEEE 802.3(Ethernet) operating at rates of 10 or 100 MB over copper or fiber.

Purpose: To develop Utility Communications Architecture(UCA), fully compliant protocols to eliminate IED communication interface devices and allow maximum interconnectivity among IEDs at a minimum cost. The protocols will allow for speed, security and reliability for real time protection and control applications. It is expected that IEDs will be able to pass data, peer-to-peer, in under 4ms. The protocol will provide the common communications for IEDs, permitting interoperability for various vendors. The use of MMS allows for the easy creation of gateways for remote access to IED information. The host computer, acting as a node on the LAN, would be able to function as an HMI, as a data storage medium and as a gateway to the corporate enterprise network.

Possible Outline of Activities: Review/enhance/develop models for controls, logging, SOE, Tags, etc Develop model as required and define uses for GOOSE Develop best use practices and implementations strategies;

- Direct OSI for peer-to-peer; multicast/broadcast OSI for event reports and time sync
- TCP\IP to allow for connections to devices via a corporate utility WAN
- Develop recommendations for testing procedures

H7: <u>INTER RELAY COMMUNICATION PROTOCOL STANDARD</u>
Chair: G. Michel
Vice Chair:
Established: 1997
Expected Completion Date:

The H7 Working Group met September 14 with 6 members and 2 guests attending. This meeting was chaired by Bill Higinbotham with Chris Huntley taking minutes.

After introductions, the minutes of the Edmonton PSCC meeting were reviewed with agreement on the modifications to the Section 4 description of the frame format. Bill Higinbotham has suggested making a minor modification to the format in order that the signal be a valid E1 signal (this could improve the acceptability of the standard as a future IEC standard). This proposal is incorporated into the draft#1 attached. Carlos Samitier kindly agreed to review the proposal to check that this simple change would in fact make the signal a valid E1 signal.

At the Edmonton meeting, discussions on the need for specifying the responses to failure scenarios in order to minimize the possibility of relay misoperations concluded to suggest:

(a) Each end shall assert an alarm, and transmit “yellow”, if it fails to receive the sync pattern (e.g. due to loss of optic signal).

(b) The mux unit when in alarm, or receiving “yellow”, shall replace the optically-received data bits with “all-ones”.

At this meeting there was some feeling that this should perhaps be a configurable option. Tim Phillipe volunteered to provide a written contribution on this subject.

The use of the overhead bits to encode the value of “N” was discussed with a unanimous agreement to include this feature, so that the relay would know if the mux was set too low (else the relay could be unaware of this condition). It was decided to use 1..12 (not 0..11).

Ken Fodero distributed some information on ST and SC connectors, and multimode fibres. Though the standard will not specify a connector, it may suggest a preferred one; the choice being ST, SC or one of the new “RJ45” footprint contenders, line MT-RJ.

Veselin Skendzic kindly distributed a possible receiver implementation, complete with a logic schematic (for FPGA instantiation); though potentially useful, the group thought the inclusion in the standard, even as an informative annex, may cause us a lot of problems with the review process.

The group concurred with the Edmonton group that we should move the PAR to PSRC land, and requested that our chair Gary Michel:

(a) Contact Bob Bratton to confirm that this was OK.
(b) Immediately request a PAR through the PSRC (Miriam is aware of this plan).

The next meeting is Jan 11 or 12, 2000 at the San Diego PSRC meeting (Mission Valley Hilton hotel). (No meeting is planned for the winter PES in Singapore).

H8: FILE NAMING CONVENTION FOR TIME SEQUENCE DATA
Chair: Jim Ingleson
Established: May, 1999
Output: Report to the PSRC
Expected Completion Date: September, 2000

Summary: After agreeing on several points, we began work on a long filename and made good progress. We will return later to the question of a compressed filename.

Introductions were made and the attendance list passed. Copies were distributed of the 1998 TRUC Disturbance Analysis Conference Paper "Survey of Event File Naming Schemes" by Makki, Makki, Rothweiler, Semati, Taylor, and Johnson.

Mr. Napikoski said that papers are being solicited for the 2000 TRUC Disturbance Analysis Conference May 1 - 2, 2000

There were no comments of the minutes of May meeting, so the minutes are approved as transmitted by email.

Copies of the email from Mr. Ingleson dated 8/17/1999 were distributed. Comments from Mr. Makki will be added as follows:

5th paragraph: "or there is no convention so users are coming up with their own."
6th paragraph: "or scattered in multiple directories."

The group agreed that multiple files per event will be accommodated, but not multiple events in one file.

Consider a single event that had impact throughout a large interconnection. We want all of the files generated to be unique.

Agreed that we have not actually, at this point, defined "event."

Agreed that we will not utilize the file extension so this will always be available for a Comtrade of other extension.

Information to be included in the long filename:

Time, Date
Severity
Type of event
Location
File Format
Type & Manufacturer
Station

Recorder Number

Having previously discussed producing both a long filename, and a short filename. We agreed that we will proceed to define a long filename. A short filename will be generated by the operating system when this file is stored on a disk.

We may revisit later a short filename which is formed by compressing part of the data in the long filename.

We discussed the power system security implications of including the exact position of our stations in each filename. An owner could choose to apply an offset to the positions. This matter was not resolved.

After discussion, it was agreed that we will include some separation characters to enhance readability. The character that we decided on is the dash (-).

We will include a flag for time accuracy. True will indicate that the time is correct as originally recorded, or has been corrected. False will indicate that the time is incorrect.

Consider new files created from multiple files such as composite files of DFR information from different events, subsets of data files.

Types of Data that could be recorded. (Phasors, Sinusoidal, Digital event information.)

The Microsoft “NT” convention will apply for saving long file names on floppy.

Should there be a flag for a modified or edited file? This was not resolved.

* Start Time - millisecond resolution, time zone, daylight saving time,
* End Time -
* Place - Longitude, Latitude, Country Code, Zip Code, Location number, location name, line name,
* Device - Manufacturer, Model, Format of Data,
* Time Resolution of Data - Sinusoidal, Phasor, RMS or Peak, Watts, VARS, transient,
* Severity
* Type of File - example, test file for relay, event, metering, SER, Composite, Power flow data,

YYMMDD-HHMMSSMMM-yymmdd-hhmmssmmm-TTD-LTlll-LGlll-MFGandModel#-

990914-130514456-990914-130534456-04D-34054-78053-ABC499FGC -

year 2 digits 1980 to 2079
month 2 digits
date - 2 digits
-
hour - 2
Month -2
second-2
millisec - 3
time zone number - 2
daylight or standard time D or S
Latitude-6
Longitude-6
Source Device, manufacturer - 3, type-8

Example - 990914-1300000-yymmssmmm-04D-LT1111-LG1111 - MMMxxxxxxxx

We need to resolve the decimal presentation of latitude and longitude. At this time we believe this presentation will define a location to 300 feet

H9: <u>Consideration in Applying PLC and Relays to Special Line Configurations</u>
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 Sept. 14th, 1999 with 8 people joining as members and 10 as guests. 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.

Topics that were discussed included underground lines and overhead line combinations, tapped lines terminated in transformers, discontinuity on lines, shunt capacitors, series capacitors and shunt reactors on lines. Assignments were allocated and due to chair by December 1, 1999.

H10: <u>Revision of the Audio Tone Application Guide C37.93</u>
Chairman: Bill Higinbotham
Vice Chairman: Jerry Hohn
Established: 1997
Output: Revised application guide
Expected Completion Date: 2000

The group met for a single session at 11:00 to 12:15 on Wednesday Sept. 15, 1999. In attendance were 6 members and 4 guests.

Members were tasked with review and writing assignments of all the major sections of the current document. The reaffirmation Ballot was reviewed. The votes tallied as follows; 39 affirmed, 3 with comments, 1 abstain.

comments were discussed and most will be included as part of the work, all will be addressed.

Ken Fodero has stepped down as chair for the group. Bill Higinbotham has accepted the Chairman position and Jerry Hohn will be the new Vice Chairman effective immediately.

Task Force Reports

HTF1: <u>SWITCHYARD DATA ACQUISITION</u>
Chairman: E. Udren
Established: 1996
Expected Completion Date: 1998

The Task Force did not meet for official business - there is none at the moment. The chairman did give an overview of the IEC 61850 substation communications system standard project, and the process bus issues in particular, to a small group of attendees who were new and not familiar with the work.

The US delegation to IEC TC 57 WG 12 has just submitted its vote on the committee draft (CD) for the Specific Communications Service Mapping for the Serial Point-to Point Ethernet Link for streaming data (IEC 61850-9-1). Along with many clarifications and corrections, the US pressed again for the inclusion of status data in the data stream, with status quality indication

bits for each status point. All of this was technically explained at the last meeting in May.

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

No report.

Old Business

No report.

New Business

No report.

I: RELAYING PRACTICES SUBCOMMITTEE
Chair: J.L. McElray
Vice Chair: Brad Nelson

The Relaying Practices Subcommittee (SC) met on September 15, 1999, in Louisville, KY. A total of 23 members and 35 guests attended. Minutes of the previous May 1999 meeting were approved. *[In an announcement soon after this meeting, the web site address was changed to http://www.pes-psrc.org/i/.]* ***Corrected minutes, as of January 12, 2000***.

I1: REVISION OF IEEE C37.103 - GUIDE FOR DIFFERENTIAL AND POLARIZING RELAY CIRCUIT TESTING
Chair: W.J. Marsh, Jr.
Vice-Chair: L. Smith
Established: 1996
Output: Revision of IEEE C37.103-1990
Expected Completion Date: 2000

Discussion centered on sections for transfer to other ct related standards currently under revision by other PSRC WGs. A draft including the May 1999, changes will be sent to WG members within 30 days.

I2: TERMINOLOGY USAGE REVIEW
Chair: B.L. Beckwith
Vice-Chair: J. D. Huddleston, III
Established: 1986
Output: Updates to IEEE 100 Standard Dictionary of Electrical and Electronic Terms
Expected Completion Date: Continuing

The WG continued resolution of negative comments on the previous ballot. The terms are resistance, fault impedance, high impedance fault, high impedance ground fault, high resistance fault, phase angle regulator, unblocking, principle failure, current differential, inadvertant energization, tripping modes (defer until the Line Protection Guide is reviewed for context). This resolves all negative comments.

I3: RELAY PERFORMANCE MEASURING CRITERIA
Chair: W.M. Carpenter
Vice-Chair: F. Marquez
Established: 1996
Output: Special Publication
Expected Completion Date: 1999
Final comments on the draft circulated this summer were resolved. The paper Transmission Protective Relay System Performance Measuring Methodology is complete and is available for posting to the web site, publication, presentation to the PSRC, and presentation to area relay conferences. During the development of the paper, several utility companies across the United States applied this measuring methodology for a year or more. This measuring methodology provides a reasonably easy common measuring system to compare different transmission systems' relaying performance and to track relaying performance over different time intervals.

I4: IEC STANDARDS ADVISORY
Chair: Eric Udren
Vice-Chair: M. M. Ranieri
Established: 1989
Output: IEC Standards
Expected Completion Date: Continuing

The WG discussed two voting documents requiring USNC response:

95/81/CD (Committee Draft): Revision of 60255-3, Single-Input Measuring Relays with Dependent or Independent Time. IEC WG 10 is developing this standard based on IEEE C37.111 on inverse time-overcurrent curves. Stan Zocholl is the convenor of the international WG. There are some updates from the IEEE document, notably in the reset and testing areas. The old IEC curves are now listed as A, B, C as before; the three standard IEEE curves are listed as D, E, F. There is no controversy over this US-proposed work, and a positive vote is planned. The Chairman noted that the US and the PSRC can feel proud that C37.111 spawned this international standards update project. However, the problem of keeping coordination between IEEE and IEC standards remains - the IEC now has the latest revision.

95/82/NP (New work proposal) Surge Immunity Test. This new surge test is proposed as a supplement to the impulse voltage insulation test already in IEC 60255-5. It uses a test generator from generic IEC environmental test standard 61000-4-5 to yield higher peak currents than the insulation test, and the relay must be in near-pickup state. The intent is to verify the energy-absorbing capacity of MOVs used to protect input circuits, and to show that the relay will not trip when exposed to a lightning-like slow surge of 1.2 microseconds rise time and 50 microseconds decay. Because of the large number of test shots specified and the cooling time between shots, the test could take days to run on one relay. The WG felt that the new test is a severe burden of time and effort, not based on any recognized need. The needed additional surge survival testing, if needed, should be incorporated in a revision of IEC 60255-5. The IEC or IEEE oscillatory burst surge test already does a good job of demonstrating that an operating relay is secure in the presence of even more intense surges having frequency components in the same range. The US plans to vote against this new project. The WG members seek any outside information on failures of MOVs or other components in recent relay designs from such surges - there is no general awareness of any problem.

The group also discussed the difficulties in developing coordinated standards between the IEEE and the IEC, even when the US proposes and chairs the work. In the cases of C37.111, the IEC work followed the US work and the result is that the IEC work is now the more current document. In the case of COMTRADE, the US revision work and the IEC work went on in parallel. The separated voting cycles produce mutual interference and make it difficult to reach a common result.

The WG circulated a recent draft from TC 77 which writes standards for generic electrical environment testing. The CD for 61000-6-5 defines the broad range of electrical environment influences for all portions of electric power networks, listing and qualifying the types of testing required in each specific installation.

We have received two terminology revision drafts from TC 1. Both deal with various types of all-or-nothing relays. We need Commentors - two WG members have volunteered.

I5: <u>TRIAL-USE STANDARD FOR LOW ENERGY INPUTS TO PROTECTIVE RELAYS</u>
Chair: Eric Udren
Vice-Chair: Peter McLaren
Established: 1992
Output: New Trial-Use IEEE Standard P1331
Expected Completion Date: 1999

The WG resolved a technical issue in PC37.94 raised by an outside party reviewing the standard - a misalignment between the low-frequency cutoff specification and the ratio error

specification for the case of fault current waveforms with long dc offsets. The issue is now resolved by forcing the designer to focus on achieving the ratio error specification only - less than 10 % for a 20 p.u. fault current with an offset of 100 ms time constant. The low frequency response can be adjusted as required to achieve this performance. The balloting body assembly and coordination check are the next steps for the standard. Harley Gilleland described an upcoming January EPRI conference on optical sensors, at which we would like to publicize the completion of this standard development. Regarding a summary paper, the WG chairman has text or commitments for all sections but section 2, to be arranged following the meeting. In addition, the WG chairman has assembled a brief PowerPoint presentation summarizing this standards project, for use in Moh Sachdev's I13 WG in January 2000, and available to others with interest.

I6: 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

The WG met to review draft 7, which included input from the May meeting. The entire document was reviewed in detail with very few suggested changes. Most suggestions in context dealt with satisfying the requirements of the IEEE Style Manual. New working group assignments were issued to review the areas identified and to suggest changes. The WG members will send information to the WG chairman who will compile the changes. The chairman will send the changes to all WG members for a final review prior to incorporating them into draft 8, which should become the final draft . All WG assignments are due October 15. (The recent request for a PAR extension was also discussed. The consensus of the WG is that it should not be necessary to have another double session because of the progress made in the last two meetings.)

I7: 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 did not meet.

I8: 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

The WG reviewed revised figures 3,4, 5, 6, and 7 of draft 4 for any changes required. Jeff Burnworth and Bill Higinbotham volunteered to make the agreed changes. The WG also agreed to change various sections of the text, which will be included in the next draft distributed by the chairman. The WG discussed the “informative” verses “normative” status of Annex B and Annex D. The WG determined that each should remain ***“informative”***. The WG discussed a concern that surge generators may not be commercially available to conduct the

transverse fast transient test. The WG concluded that the draft contains information sufficient to perform the transverse tests using commercially available generators. Veskin Skenzic volunteered to add an explanatory paragraph to the beginning of Annex C. Assignments are due to the chairman by the last day of October.

I11: RELAY TEST PRACTICES SURVEY
Chair: Ed Krizauskas
Vice-Chair: Bill Lowe
Established: 1998
Output: Transactions Paper
Expected Completion Date: 2001

Larry Lawhead has prepared a revised questionnaire. There are still some modifications needed. Jim Ingleson will discuss modifying the survey with Lawhead, or if Lawhead is unable to do it, Ed Krizauskas will work on the survey modifications. Krizauskas will prepare a draft cover letter and distribute to the WG by October 10. The survey should be fixed and distributed to the WG by November 1. Jim Ingleson will put a self-extracting file of the Survey on the I11 website, along with the cover letter. For widespread survey distribution, a self-extracting file will be e-mailed to the utilities on the PSRC list plus the utilities on the Mailing List Task Force list. The goal is to be ready to begin distribution by Nov. 1. The PSRC members will be asked to provide e-mail addresses of protection engineering personnel or responsible parties from other utilities neighboring them which do not attend PSRC meetings. The responders will be asked to fill out the survey and return the files to Krizauskas within 4 weeks. (Effective after this meeting, Jim Ingleson will step down as Chairman of the WG. Krizauskas will become Chairman and Bill Lowe will be Vice-Chairman.

I12: REVISION OF C57.13.1 - GUIDE FOR FIELD TESTING OF RELAYING CURRENT TRANSFORMERS
Chair: Mike Meisinger
Vice-Chair: Fidel Marquez
Established: 1998
Output: Revision of IEEE/ANSI C57.13.1-1981 (R1992)
Expected Completion Date: 2002

The Chairman reported on a special task force meeting earlier that day which discussed transferring sections between the four ct-guides presently under revision within the PSRC. (Details on the transferred material are detailed in the subcommittee New Business section.) Drafts on winding and lead resistance, excitation voltage measurement considerations, hysteresis-loop measurements and optical current sensors were distributed and discussed. Paul Lerley will modify the draft as discussed and will provide copies at the next meeting.

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 Ricardo Singh inquiry, forwarded by Linda A. Gargiulo of the IEEE Standards Activities, were distributed. Singh asked the reasons for grounding the neutrals of cts in the control room instead of in the substations. The issue was discussed and reasons were identified. These will be sent to the Standards Activities of IEEE for sending to Singh. Gerry Fenner briefly described the practice of his utility for grounding shields of cables carrying

secondary circuits. The WG decided to conduct a survey to determine present utility practices for grounding secondary circuits and cases. Before October 15, members will send the Chairman suitable questions for the survey. The questionnaire will be finalized at the January Meeting. Harley Gilleland made a presentation describing the ABB optical current and voltage transducers. The presentation included the method of transmitting signals from electronic modules in the control room to the transducers and back, and interpreting the received signals. He also outlined the present practice of grounding the devices and their optic cables.

I14: TELECOMMUNICATION TERMS/NEW TERMS USED BY PROTECTION ENGINEERS
Chair: D. Zugris
Vice-Chair: A. Apostolov
Established: 1998
Output: Special Publication
Expected Completion Date: 2003

The WG did not meet.

I15: 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

A draft copy of the guide was passed out for WG review. Past writing assignments were reviewed and changes were made to the draft. The main goal of the revision is to add more application examples. WG members agreed to provide more application examples before the next meeting. Barry Jackson volunteered to give a presentation on a 230 kV ct failure at the next meeting.

I19: ANALYSIS OF SUBSTATION DATA
Chair: L. Smith
Vice-Chair: C. Shank
Established: 1995
Output: Special Publication
Expected Completion Date: 1999

The WG did not meet.

***Task Force Reports*:**

1. **ITF1: Relay Service Letter Database: J. Ingleson.** No new activity to report.
2. **ITF2: Evaluate Suggestion for a Digital Relay Application Guide: M. Sachdev.** Based on the 1997 tutorial on Advancements in Microprocessor Based Protection and Communication (IEEE 97TP120-0), the TF reviewed a suggestion for a guide for the application of digital relays. The TF concluded that such a guide would be impractically large and out-of-date by the time it was completed. Therefore, no such project is suggested ***at this time***.
3. **ITF3: Evaluate the Need for Revision of C37.98 Standard for Seismic Testing of Relays: Chair: M. Clark, Vice-Chair: M. Bajpai.** The TF did not meet.

***Liaison Reports*:**

1. **Instrument Transformers Subcommittee of the PES Transformers Committee: Jim Huddleston III.** Instrument Transformers Subcommittee met in New Orleans on April 12-15, 1999, during the IEEE T&D show. The minutes are not available, so there is nothing to report.
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: Jim Huddleston.** Tom Nelson expects to have a new draft in October, 1999. A two year PAR extension has been requested.
4. **Proposed C57.13.6 Instrument Transformers for Use with Electronic Relays and Meters: Jim Huddleston.** Nothing to report.
5. **T&D Committee:** No liaison.

***Old Business*:**

No issues were taken up.

***New Business*:**

A new WG, labeled I9, was announced. The WG will revise C37.105 Standard for Qualifying Class 1E Protective Relays and Auxiliaries for Nuclear Power Generating Stations.

WG I14, Telecommunication Terms/New Terms Used By Protection Engineers, is seeking a new chairman. Contact Jeff McElray if you are interested.

A special TF of ct-related SC/WG leadership met in closed session yesterday to determine the best reorganization of material within the four following guides currently in revision. The guides and the detailed changes are:

C37.103 – 1990 Guide for Differential and Polarizing Relay Circuit Testing

Move clauses 3.1 and 4.4 to the revised C57.13.1 and give references. Insert optical ct application as it relates to differential and polarizing relays.

C37.110 – 1996 Guide for the Application of Current Transformers Used for Protective Relaying Purposes

Move the testing portion of clause 4.6.2 to the revised C57.13.1 and give reference. Insert optical ct application as an Annex.

C57.13.1 – 1981 Guide for Field Testing of Relaying Current Transformers

Receive clauses 3.1 and 4.4 from C37.103-1990 and the testing portion of 4.6.2 from C37.110-1996 for the revised C57.13.1. Insert optical ct testing in the revised guide. Move clauses 4.0, 4.1 and 4.2 to the revised C37.110 and give reference.

C57.13.3 – 1983 Guide for Grounding of Instrument Transformer Secondary Circuits and Cases

Insert an optical ct grounding application in the revised guide.

Brad Nelson will step down as vice-chairman of the Relaying Practices Subcommittee at the end of 1999. (The three-year position would normally run through the year 2000.) Jeff Gilbert will assume the vice-chairman duties starting in January 2000.

Jeff McElray will step down as chairman of the Relaying Practices Subcommittee following the summer of 2000 PES meeting. (Normally, his three-year appointment would have continued through the end of 2000.) Jeff will then assume the duties of the PSRC Standards Coordinator. Jeff Gilbert will take over the leadership of the Relaying Practices Subcommittee before the September 2000 PSRC meeting.

J: ROTATING MACHINERY PROTECTION SUBCOMMITTEE
W.P. Waudby, Chairman
R.D. Pettigrew, Vice Chairman

The subcommittee met on September 15, 1999 with 7 members and 8 guests present. Minutes of the May 12, 1999 meeting in Albuquerque, NM were approved. There were no Advisory Committee items of interest brought forth by the Chairman.

J1: REVISION OF C37.106-1987 GUIDE FOR ABNORMAL FREQUENCY PROTECTION FOR POWER GENERATING PLANTS
G. Benmouyal, Chairman
T. Sezi, Vice-Chairman
Established: 1996
Output: Standard Revision of IEEE/ANSI C37.106-1987
Expected Publication Date: December 1999
Status: Working on Draft 5

The working group met with 6 members and 3 guests present. Discussions were held regarding the documents organization and additional content that would be required. Several assignments were accepted to review sections, rewrite sections, and to reorganize sections of the document.

J2: AC MOTOR PROTECTION TUTORIAL
S. Zocholl, Chairman
M. Baldwin, Vice-Chairman
Established: 1998
Output: Tutorial on AC Motor Protection
Expected Completion Date: 2000
Status: Reviewing Working Group Assignments

Five members and 4 guests attended the fifth meeting of the Working Group. George Parr chaired the meeting. The working group discussed the target audience, the use of examples and thermal modeling of motors. Some new writing assignments were accepted.

J3: REVISION OF THE AC MOTOR PROTECTION GUIDE
J.D. Gardell, Chairman
M. Bajpai, Vice-Chairman
Established: 1993
Output: Standard Revision IEEE/ANSI C37.96
Expected Completion Date: 1999
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
S. Patel, Chairman
K. Stephan, Vice-Chairman
Established: 1998

Output: Transaction Paper
Expected Completion Date: 2000
Status: Forming Draft 0

The Working Group J6 met in a single session with 9 members and 14 guests.

The WG reviewed and commented on five writing assignments that were received since the May meeting. There was much discussion about loss of field relaying in relation to excitation limiters and machine capability particularly with respect to machine terminal voltage. Exciter protective features and ferroresonance were also discussed.

The writing assignment for Section 3 was received and distributed at this meeting but was not discussed.

J7: REVISION OF 37.105 IEEE STANDARD FOR QUALIFYING CLASS 1E PROTECTIVE RELAYS AND AUXILIARIES FOR NUCLEAR POWER GENERATING STATIONS
S. Mazumdar, Chairman
S. Usman, Vice-Chairman
Established: 1999
Output: Standard Revision IEEE C37.105-1987
Expected Completion Date: 2003
Status: New Working Group being formed

The Working Group had its first meeting with 5 members and 4 guests.

Writing assignments were made. Discussion on contacting companies that provide third part qualification was discussed. Input from relay manufacturers on qualifying microprocessor based protective systems will be sought.

This working group will be moved to the Relay Practices Subcommittee. This is the subcommittee of origin and will coincide with the revision of a partner standard: C37.98, Standard for Seismic Testing of Relays.

Liaison Reports

1) Electric Machinery Committee, C.J. Mozina

No report given.

Coordination Reports

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

This working group did not meet at the Summer Power Meeting. Tom Higgins sent us a memo stating that they have received approval from IEEE for their PAR.

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

No activity.

Old Business

Joe Uchiyama is the Chairman for revising the Generator Ground Protection Guide. Ratan Das is the Vice-Chairman. The first meeting will be in January 2000.

New Business

Subcommittee members were asked to review C37.102, Guide for AC Generator Protection, to determine if it needs to be revised.

There was some discussion on the need for additional SC members, especially in the user category. Names for prospective members should be forwarded to the SC Chairman for further contact.

K: SUBSTATION PROTECTION SUBCOMMITTEE
Chair: C.F. Henville
Vice Chair: S.R. Chano,

The Subcommittee met on September 15, 1999, with 18 members and 18 guests present. The minutes of the previous meeting in Albuquerque were approved with no modifications.

K1: PROTECTION OF PHASE ANGLE REGULATING TRANSFORMERS
Chair: Mohamed Ibrahim
Vice Chair: Frank Plumptre
Established: 1999
Expected Completion Date: 2000
Output: Summary Paper

The WG met for one session with 9 members and 6 guests. K1 has completed their first assignment for the special publication, which will soon be available on the Substation Committee Web page. Assignments were given for the summary paper to be completed prior to the January meeting. The Summary paper will be completed by the January meeting and will be ready for balloting by the May 2000 meeting.

K2: TRANSFORMER PROTECTION GUIDE
Chair: R. Hedding
Vice Chair: R.W. Haas
Established: 1991
Output: Revision of Standard ANSI C37.91
Expected Completion Date: 1999
Status: Ballot re-circulation- Draft 13

The K2 working group met in a single session with 10 members and 11 guests in attendance. A copy of draft 13, which has been submitted to the Standards Board, was distributed. Several impediments seem to be in the way of this guide getting approved. First, following a few minor changes to figures, and a clarification of section 6.2.8 to resolve most of the negative ballots, draft 13 was assigned to the guide. Of course, the Standards Board caught this difference between draft 11, balloted, and draft 13 submitted for approval, and strongly suggested re circulation of the guide. Second, there still exists the problem of the remaining negative ballot which is basically that the name of the guide should be changed to reflect fusing, or section 6.1 should be deleted. The working group discussed several scenarios to deal with this negative ballot from the Standards Board:

1. Since "other devices" is included in the scope of the PAR, and fuses are other devices, fusing is in the scope of the guide.
2. Fusing, specifically, section 6.1 has been in the guide since it was initially published.
3. Several guides created by the PSRC discuss fusing: Shunt Capacitor Protection, etc...
4. If this argument does not work, then a PAR modification will be asked for to change the name of the Guide to eliminate the name relays.

It is hoped to resolve these issues before the January Standards Board Meeting.

K3: TRANSFORMER THERMAL OVERLOAD PROTECTION
Chair: Glenn Swift
Vice Chair: S. Zocholl
Established: 1995
Expected Completion Date: 1999
Output: Transactions paper

Status: Draft 3A

The Chair thanked members for their input to Draft 3 of the IEEE paper based on the Working Group recent report. The present status of the Ballot results is as follows: 18 Approved with no comments, 4 Approved with comments and 4 did not reply. All comments have been addressed to the satisfaction of those in attendance, so the paper is considered ready for balloting by the Substation Subcommittee. The WG will remain active until the balloting is complete. 10 members and 8 guests attended the meeting.

K4: <u>BUS PROTECTION GUIDE</u>
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 in a single session with 8 members and 20 guests present. There was a discussion on the goal of the WG to consider establishing a Balloting Body in the near future. It was agreed to have one last look at the Draft 15. This is to be considered a "consensus poll of both the SC and WG. Based on comments received, the WG will prepare a draft to send to the Standards Board for ballot in January of 2000. Clause 3.5 was discussed, and the last paragraph of the clause will be changed to replace the specific use of half rating, with lower in the first sentence and likewise use much lower in the next sentence. Walt Elmore is to provide a write up discussion on sensitivity and speed. Figure 1 B was discussed as to the use of phase relays connected to the polarity terminal of the line-side CTs. The WG agreed that the figure is OK as is. A ground will be added to Figure 1B at the bottom of 87B/G circle. Clause 4.1.2 was relocated and the WG agreed with this change. Clause 4.1.3 will be modified by Dr. Kasztenny to discuss use of different ratio CTS and the application with numerical relays and the ability to compensate for different CT ratios. Clause 4.1.6 on the use of MOCT will use a reference from WPRC. Skip Williams will submit a write up for clause 4.1.7 to discuss central processor unit type of bus differential relaying to enhance the existing clause writing. Section II 2. B. of the Annex C was revised to exchange the order of the two statements, putting the DDT first. Draft 15 will be sent to the SC and the WG for polling. The Chair will also have the Draft placed on the PSRC web site under the K SC portion.

K5: <u>NETWORK TRANSFORMER PROTECTION GUIDE</u>
Chair: C.R. Sufana
Vice Chair: J.J. Horwath
Established: 1994
Output: Revision of Standard ANSI C37.108
Expected Completion Date: 1999
Status: Draft ballot

Working Group K5 met in a double session with 8 members and 4 guests present. Charlie Sufana spoke about his meeting with the Distribution Task Force at the PES Summer Power Meeting. This Task Force is working on a tutorial on network design and operation. Charlie Sufana will distribute drafts of each of the tutorial sections to each working group member by mail for them to comment on. The WG review of Draft 7 was completed. The Chair will incorporate the latest comments into a new draft for re circulation to the balloting body. The document will be submitted to the Standards Office by the middle of October. A new section is to be added to Annex C covering the effects of harmonics on the protection of network transformers. Vittal Rebbapragada will provide a write up to the chairman. Bill Feero reported

that interest in attaching distributed generation sources including photo-voltaics and micro turbines is increasing and he was interested on the suitability of this interconnection on the secondary network system.

K6: SHUNT CAPACITOR PROTECTION GUIDE
Chair: G. Fenner
Vice Chair: S.R. Chano
Established: 1994
Output: Revision of Standard ANSI C37.99
Expected Completion Date: 2000
Status: Re-circulation draft 8

The WG met in a single session to resolve all outstanding items of Draft 8. The document has been balloted and all negative ballots have been resolved. All other changes discussed were minor editorial changes. The corrections will be made to Draft 9 to be sent out for re circulation. If there are no further negative ballots, the WG will then complete its work in the year of 2000. The Chair will request a PAR extension in case we pass the PAR deadline. The WG will be meeting with the Capacitor Committee of the T&D in San Diego. This is an opportunity to discuss any future revisions to C37.99 and other Capacitor Guides and Standards. 12 members and 12 guests attended the meeting.

TF (K7): GUIDE FOR THE PROTECTION OF SHUNT REACTORS
Chair: K.A. Stephan
Vice Chair: P.G. Mysore
Established, 1999
Output: Revision of ANSI/IEEE C37.109.
Expected Completion date: 2002

The WG did not meet at Louisville. A task force of 9 members and 13 guests met instead. A PAR has been submitted and has just completed circulation for coordination. Coordination by circulation of drafts has been requested by Substations Committee. Miriam Sanders will now submit the PAR to the Standards Board for approval. The task force further discussed the changes they would like to see in the Guide. It was agreed to not change the present guide's organization at this time. Simon Chano, Vittal Rebapragadda, Charlie Henville, Dean Miller, Roger Hedding, Pratap Mysore accepted writing assignments to be completed and issued to the group before the next 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
Status: Draft 6

The WG met in a double session with 8 members and 11 guests present. Draft 6 of the guide has been balloted. The ballots were due September 10 and the final results are not known at this time. Several comments have been received regarding 2 negative ballots associated with the section discussing microprocessor relaying. This section will be revised to address the concerns raised. The Chair will contact the persons who voted negatively and present the revised section in an attempt to resolve this issue. Editorial suggestions were made and they will be incorporated into the final document. All remaining comments will be resolved by E-mail and the Chair will re circulate the document before the January meeting.

K9: RELAY TRIP CIRCUIT DESIGN
Chair: D.C. Dawson
Vice Chair: J. Gosalia
Established: 1988
Output: IEEE Special Publication
Expected Completion Date: 1998

The Working Group did not meet at Louisville. Balloting of the K SC was conducted over the summer on the Summary Paper of Relay Trip Circuit Design. 22 affirmative ballots and 3 abstentions were received from the 29 members. Comments from the one ballot were resolved with the balloter. Therefore, the ballot is successful; and the summary paper will be submitted to IEEE as a Proceeding paper. Since there is no further work for the WG, it was disbanded with the thanks of the K Subcommittee.

K10 (Ex KTF1): SCC21 Distributed Resources Standard Coordination
Chair: William Feero
Vice Chair: Doug Dawson
Established: 1999
Expected Completion Date: 2001
Output: Standard through the SCC 21

Only a brief WG meeting was held with nine members and four guests in attendance. The WG have not yet received an organized draft of the P1547 standard under development by SCC21. At least Doug Dawson and Bill Feero will attend the next meeting of the P1547 Working Group which will be held in Washington, DC on September 28, 29, and 30. According to their meeting announcement, a draft of sections submitted by September 1st will be handed out. If these are not available electronically, Steve Conrad has volunteered to scan the written material. The WG hope to make it available by email to all members for review, comment, and suggested revisions or additions in time for Doug Dawson or Bill Feero to respond to the SCC21 before their next meeting which is December 1-3 in Tampa. One of the emerging hot issues is connection of DSG onto network systems. The WG will coordinate with Charlie Sufana, WG K5, who is in the final stages of developing their network transformer protection guide. This guide has a section which strongly recommends against such interconnecting. Doug Dawson agreed to serve as the Vice-Chair of K10.

K13 (Ex KTF13): GUIDE FOR PROTECTIVE RELAY APPLICATION OF TRANSMISSION-LINE SERIES CAPACITOR BANKS
Chair: A.F. Elneweihi
Vice Chair: F.P. Plumptre
Established: 1999
Output: Guide for the application of protection on transmission series capacitor banks
Expected Completion Date: 2003

The task force met in one session with 8 members and 9 guests in attendance. The Chair informed the group that the PAR PC37.116 titled "Guide for Protective Relay Application to Transmission-Line Series Capacitor Banks" has been submitted to the IEEE Standards Office. The Standards Board will make the decision in its 30 January 2000 meeting regarding the submission. A joint session will be held in the upcoming meeting between this WG and the IEEE T&D WG on series Capacitors. It was agreed in the meeting that the proposal wording for the WG assignment should be as follows: " To prepare a guide for the application of protective relays on transmission-line series capacitor banks". An outline for the guide was discussed.

Assignments were given to some WG members for them to present at the next meeting their proposals for the material that should be included in this guide.

Liaison Reports:

1. **Transformer Committee, J.D. Huddleston III**
   Nothing new to report. The Transformer Committee was scheduled to meet in New Orleans in April, 1999.

Coordination Reports:

1. **ANSI/IEEE Switchgear Standards, F. Plumptre**

   a) **ANSI/IEEE Standard C37.20.3 Standard for Metal-Enclosed Interrupter Switchgear**
   Nothing to report.

   b) **C37.100.1, Common Requirements for IEEE Power Switchgear Standards**
   ADSCOM advised the WG to proceed with the issuance of a new PAR. Highlights of Task force reports of C37.100.1 summarized below.

   Ratings - Tabulation of information to be ready by November 99
   Design & Construction - Input and coordination needed from NEMA
   Type Tests - Section 6 of IEC 694 reviewed by this task force
   Routine Tests - first review of Routine Tests section of Common Clause Document made. Did not find many differences between IEC and IEEE standards.
   Service Conditions - Extensive table on Altitude Correction factors (ACF) developed. IEC is changing its documents to reflect ACF values with a base at sea level rather than the current 1000 meters. Increase in design voltages required to maintain sea level ratings. IEEE approach is to show de-rating factor required to be applied to sea level voltages to obtain their equivalents at higher elevations.

2. **ANSI/IEEE Standard C37.20.2 Standard for Metal-Clad Switchgear, C.F. Henville**
   The balloted Draft 8 is now being reviewed by RevComm. They are expected to vote on it on 15th September. It is expected that this standard will be published soon. It is probable that no more coordination will be required on this standard until work on the next revision is started.

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.

4. **PC62.91-SPD, Revision of IEEE 32 Requirements, Terminology, and Test Procedures for Neutral Grounding Devices, D.C. Dawson.**
   No report.

5. **C37.66 Requirements for Capacitor Switches for Ac Systems, S.R. Chano.**
   Nothing is reported.

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**
   A new draft will be available soon. The new document does not include many changes from the previous draft.

8. **8.P1538 (When approved) Guide for Determination of Maximum Winding Temperature Rise in Liquid Filled Transformers, Dan Hollands**
   Nothing is reported
9. **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

New Business
Two presentations were made during the Subcommittee meeting. Glenn Swift gave a short presentation on a Thermal Overload Prediction System for Power Transformers, and Phil Winston presented a recent power outage which occurred in the Atlanta area last summer.