

**POWER SYSTEM RELAYING  
COMMITTEE**

**OF THE**

**IEEE POWER ENGINEERING SOCIETY**

**APPROVED  
MINUTES OF THE MEETING**

**May 21-24, 2001**

**Vancouver, BC, Canada**

**Power System Relaying Committee  
Main Committee Meeting Agenda  
May 24, 2001  
The Empire Landmark  
Vancouver, Canada**

- |             |   |                  |
|-------------|---|------------------|
| <b>I.</b>   | <b>Call to order / introductions</b>  | <b>Nail</b>      |
| <b>II.</b>  | <b>Approval of Minutes – Austin meeting and misc.</b>   | <b>Winston</b>   |
| <b>III.</b> | <b>Reports of Interest</b>  |                  |
|             | <b>A. Chairman’s Report</b>   | <b>Nail</b>      |
|             | <b>B. Technical Paper Coordinators Report</b>   | <b>Taylor</b>    |
|             | <b>C. PES Report</b>  | <b>McDonald</b>  |
|             | <b>D. Cigre Report</b>  | <b>Cease</b>     |
|             | <b>E. EPRI Report</b>   | <b>Burger</b>    |
|             | <b>F. IEC Report</b>  | <b>Udren</b>     |
|             | <b>G. Standard Coordinators Report</b>  | <b>Sachdev</b>   |
|             | <b>H. Substation Committee Report</b>   | <b>Tengdin</b>   |
| <b>IV.</b>  | <b>Subcommittee Reports- in order</b>   |                  |
|             | <b>H - Relaying Communications</b>  | <b>Simon</b>     |
|             | <b>I - Relaying Practices</b>   | <b>Gilbert</b>   |
|             | <b>J - Rotating Machinery</b>   | <b>Pettigrew</b> |
|             | <b>K - Substation Protection</b>  | <b>Chano</b>     |
|             | <b>D - Line Protection</b>  | <b>Westfall</b>  |
|             | <b>C - Systems Protection</b>   | <b>Thorp</b>     |
| <b>V.</b>   | <b>Old Business</b>   | <b>Nail</b>      |
| <b>VI.</b>  | <b>New Business</b>   | <b>Nail</b>      |
| <b>VII.</b> | <b>General Announcements</b>  | <b>Nail</b>      |
|             | <b>Special Presentation- Protection of High-Voltage<br/>Generators Connected Directly to the Transmission<br/>Network</b> | <b>Lindahl</b>   |
| <b>IX.</b>  | <b>WG Report: New Technologies Related to<br/>Transmission and Distribution Protection</b>                                | <b>Apostolov</b> |

**Adjourn**

**Call to order / introductions****Nail**

George Nail called the spring meeting of the IEEE/ PSRC Main Committee in Vancouver, BC, Canada to order at 8:05 am on May 24, 2001.

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

The minutes of the January in Austin, Texas were approved.

**Chairman's Report****Nail**

PES Officers are still struggling with format, content and date for the new Spring Meeting concept that is scheduled for 2003. The original date of May 2003 has now been firmed up as July 2003 with the intent of moving to May in 2004. The July 2003 meeting is now scheduled for Toronto. While there is still talk about trying to get all the committees to meet at the same time for the spring meeting, PES is in a heated discussion about how to coordinate the existing committee and technical sessions for 2003. PSRC does not have any plans to try to meet at the same time as the PES spring meeting. There appears to be some concern with having meetings at T&D in Atlanta. The manufacturers are paying a lot of money to set up exhibits and they do not want technical sessions or committee meetings distracting attendees.

All Transaction Papers will be reviewed electronically in the future. Phil Winston will maintain the archives for the PSRC Minutes. The current meeting minutes will be on the web site for viewing or downloading. The goal is to have all minutes on the web site by the middle of July. We have moved all the web site files off of the IEEE site and onto the PSRC site. A procedure will be given to those responsible for updating minutes so it can be done directly without going through a third party. It is anticipated that we will have a new B WG that will oversee this activity.

**Technical Paper Coordinators Report****Taylor**

No Report Received

**PES Report****John McDonald**

The IEEE PES Executive Committee (ExCom) met on Thursday, April 5, 2001 in Amsterdam, The Netherlands, prior to the Region 8 Chapter Chairs meeting. The meeting location was chosen so the ExCom could participate in the Region 8 Chapter Chairs meeting on Friday morning, April 6.

**New PES General Meetings**

Tentative date for the IEEE PES General Meetings, beginning in 2003, is the first week in May. There is no location information yet.

**Industry Leaders Focus Group Meetings**

The IEEE PES held a focus group meeting with executives of major companies in Columbus during the recent Winter Meeting. The purpose of the focus group was to learn how the IEEE PES can do a better job for them, and to make them better aware of the PES. A number of possible strategies were raised at the focus group meeting. These strategies have been assigned to various Governing Board members for implementation. IEEE PES plans to hold focus group meetings with local industry leaders in the geographical areas of future meetings.

**Transactions Paper Review Process**

Improvements in the transactions paper review process are being implemented to ensure the reviews are completed within ninety days from receipt of the paper. The Editors-in-Chief (EIC) of the three transactions are expanding their Editorial Boards to eliminate the bottlenecks caused by a few areas receiving a very large number of papers. In addition, the reviewer database is being expanded so that the Editors have a larger pool of reviewers to draw from. The Editorial Boards will be published in their corresponding transactions. The structure to handle the transactions paper review process has been "flattened" with the EICs working directly with the Editors who will work directly with the reviewers. The new on-line paper review system will provide much-improved tracking of paper reviews as well as the handling and transfer of papers. Authors who have submitted transactions papers will be notified that their paper was received, and the authors can log onto the PES web site and check the status of their paper's review.

### PES Annual Report

All Committees within the IEEE PES completed an Annual Report for 2000. A template was developed for this brief report, including items such as significant accomplishments in 2000, benefits to industry from the 2000 work, benefits to volunteer participants from the 2000 work, significant plans for 2001, and problems and concerns. The individual reports are being collated into a meaningful PES Annual Report that can be used to publicize the value PES provides to various stakeholders including members and employers.

### IEEE Xplore

IEEE Xplore is functional and currently "free" to IEEE members. In order to access it as a member one needs to have an IEEE web account. Once online, an IEEE member can browse all IEEE Transactions Table of Contents and Abstracts and use the search capability for all IEEE Transactions back to 1988. In order to access and download the full text of a specific paper, an IEEE member must also be a member of the society that owns the transaction in which the paper is published. Studies are currently underway for pricing models to charge for downloading of individual papers for IEEE members who are not members of the parent society. Currently, PES is not charging members for electronic access to any or all PES transactions papers back to 1988. Eventually transactions papers from 1996 forward will be available in fully tagged format as well as the current PDF. In addition to transactions the following are available through Xplore:

1. All issues of CAP and Power Engineering Review back to 1988. PES members have access to the full-text PDF files.

A large amount of conference proceedings material in PDF format.

All current standards

### Two New Technical Council Coordinating Committees

The IEEE PES Technical Council has established two new committees, to broaden the scope of work of the PES and to encourage people in these areas to join the PES. As the power industry expands its work areas, the PES will address these new areas within the Technical Council in this way. The names of the new committees are Emerging Technologies Coordinating Committee and Policy Development Coordinating Committee. The Emerging Technologies Coordinating Committee scope includes cross technical committee coordination of all matters in which the dominant factor is the research, development and application of emerging technologies for the power industry. The Policy Development Coordinating Committee scope includes the development of policies in all matters in which the dominant factor is the commercial aspects of the electric power industry. The IEEE PES is considering other actions to address new work areas within the power industry.

### Distinguished Lecturer Program

The current Distinguished Lecturer Program (DLP) contains more than fifty lecturers on the topics of power generation, power system engineering, power system relaying, rotating machinery, substations, surge protection, switchgear, FACTS controllers, FACTS transmission planning issues, deregulation, electric vehicles, standards/codes, and superconductivity. Many IEEE PES Chapters worldwide took advantage of the DLP in 2000. Some Chapters held fundraising one-day seminars using a DLP speaker. The travel costs for the DLP speaker are covered by the IEEE PES, making this an attractive way to bring an industry expert to a Chapter meeting to discuss a "hot" industry topic. More Chapters are encouraged to take advantage of this.

#### New Training Opportunities

New training opportunities were offered at the Winter Meeting in Columbus in 2001 on the fundamentals of power systems and on the business side of the power system industry. The IEEE PES is considering a class on power systems for non-technical managers of power engineers, public service commission staffs, legislators, and power traders. The course would be appropriate for senior and middle management who are not engineers or have not worked in an electric utility as an engineer, regulators, public service commission staffs, legislators, power traders, power marketers, electric consumer groups, policy makers and managers of significant power users. The Power Engineering Education Committee has now assumed responsibility for the final development of the course. The target date for the first course is the 2002 Winter Meeting in New York. The IEEE PES will continue to offer new training opportunities at future meetings.

#### PES Fellows Nominations

Recognizing the achievements of its members is an important part of the mission of the IEEE. The IEEE grade of Fellow is conferred upon a person of "outstanding and extraordinary qualifications and experience in IEEE designated fields, and who has made important individual contributions to one or more of these fields". The total number of Fellows selected each year does not exceed 0.1% of the total IEEE membership. The number of IEEE Fellow nominations for PES members has declined in recent years. As a professional community, the IEEE PES needs to be more proactive in nominating colleagues for this significant award.

#### PES Meetings Brochure

An IEEE PES meetings brochure was prepared and mailed out in Fall 2000 to publicize all 2001 and 2002 meetings. The brochure was sent to all PES members, as well as a wider distribution to promote PES meetings and encourage non-PES members to attend. This brochure will be published in September each year to promote the IEEE PES meetings for the following two years.

#### Intersociety Agreement

The Power Engineering Society, Industry Applications Society, Power Electronics Society and Industrial Electronics Society have formed an Intersociety Agreement. PES is emphasizing the formation of Joint Chapters and the combining of the four society's Distinguished Lecturers Programs. An electronic four-society transactions package has been offered to members of the four societies.

#### IEEE Finances

ExCom discussed the considerable impact felt on PES reserves that were initiated by the continuing deficit spending policy in place at IEEE. While PES remains financially sound, much of the revenue generated by PES is being taken by IEEE for new programs and staff expansion over which PES not only has no control but no voice. This will be the subject of a future feature article in the PES Review.

### Industry-Education Council on Manpower Development

The charter of this council is to strengthen the collaboration between the electricity industry and universities through identifying new mechanisms for collaboration for producing a new breed of electrical engineers to meet the challenges of the redefined industry. It is expected that such an effort will not only help universities to keep pace with the new electricity industry, but it will also help to generate student interest in power programs and benefit the industry by providing a strong academic resource and base for recruitment of new talent. In addition, the efforts of the council will promote the realization that engineering skills will continue to be needed -- especially in the long term -- in the broad electricity industry. This need suggests preservation of power engineering education infrastructure, and the council will help to promote and find mechanisms to implement this preservation. To this end, plans are underway for a two-day workshop at the National Science Foundation (NSF) in Fall 2001. It is anticipated that the workshop will have 25 participants from industry and 25 from academia.

### Internet Conferencing

ExCom participated in an Internet Conference with IEEE representatives in the United States, as a demonstration of the operation of this IEEE service. IEEE members can create live interactive meetings with anyone at anytime through the use of Internet Conferencing. The only things required are a web browser and a telephone. IEEE offers this service in partnership with PlaceWare, Inc., to all IEEE entities. Internet Conferencing provides the capability to share information over the Internet incorporating PowerPoint presentations, live software demonstrations, web tours and polling while attendees listen in to the audio portion of the meeting via telephone. More information is available at the following web site:

<http://www.ieee.org/web/webconf>.

### Upcoming Board Meetings

The IEEE PES Governing Board will meet in conjunction with the 2001 IEEE PES Summer Meeting in Vancouver, B.C., Canada on July 19. The IEEE PES Executive Committee (ExCom) will meet on November 2 in Atlanta, Georgia in conjunction with the IEEE PES Transmission and Distribution Conference and Exposition.

### **CIGRE SC34 Report**

### **Cease**

The CIGRE SC34 2001 colloquium will be held in Sibiu, Romania September 10-14. The US National Committee has 7 papers at this meeting.

The 2002 General Session of CIGRE will be held August 25-30, 2002 in Paris, France. We received 2 papers from US authors.

As in the past, the USNC CIGRE has a quota of 10 papers for this meeting, with a possibility of getting in a limited number of additional papers under special quotas. The Technical Committee of USNC will review all the submitted papers and select the US contingent of papers.

The preferential subjects for the 2002 session of CIGRE are:

### **GROUP 34 (POWER SYSTEM PROTECTION AND LOCAL CONTROL)**

Preferential Subject 1: Cost benefits of substation automation.

- o What are the savings in investment, operation and maintenance cost? What are the cost evaluation strategies and methods?
- o What are the driving forces of substation automation? What are the technical and economical criteria? What is the impact of modern communication and data processing? How has asset management been influenced? What role do deregulation and global business orientation play?

Preferential Subject 2: Refurbishment of protection and substation control: experiences and strategies.

- o What are the criteria and methods for updating, improving, replacing/refurbishing? (Equipment age, failure statistics, cost consideration, operational requirements, etc.) To what extent are computer programs available and used? What services are offered on the market?
- o Are the possibilities of digital substation automation and communication including Internet technology fully used? To what extent are new technologies (sensors, process bus, etc) applied or planned to be used in future? Are vendor specific solutions accepted or open systems required?
- o What strategies and procedures have been developing in practice (total or step by step renewal, time frames, etc)? What are the recent experiences and lessons learned? What is the impact of deregulation?

**EPRI Report**

No Report Received

**Burger**

**IEC Report**

No Report Received

**Udren**

**Standard Coordinators Report**

**Sachdev**

The Standards Coordinator, Mohindar Sachdev, met with the Chairs of the WGs writing and revising standards documents on May 22, 2001 in Room 520, The Empire Landmark, Vancouver BC, Canada. The status of PARs, Standards and Guides was reviewed. The actions to be taken for keeping the approval of the PARs up-to-date and keeping the Standards and Guides live were identified. A summary of the specific approvals received since the January 2001 meeting of the PSRC and the actions that need to be taken soon are identified in this report.

The IEEE Standards Web page has Word templates, the style manual, and operations manual that can be downloaded for use in developing new standards and for revising standards. The address of the Web site is as follows.

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

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

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>

The activities of the Standards board are posted on the web site at

<http://www.standards.ieee.org/board/nes/> and

<http://www.standards.ieee.org/board/rev/>

A list of new, revised and withdrawn standards and standards projects listed by sponsoring IEEE Society are posted on the web site at

<http://www.standards.ieee.org/sa-mem/bdapp.html>

#### STANDARD ACTIVITY SINCE THE JANUARY 2001 MEETING OF THE PSRC

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

##### Standards Reaffirmed

- |           |  |
|-----------|--|
| C37.90.2  | Standard for Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers: Reaffirmed by the Standards Board on 2001 March 17. |
| C37.102   | Guide for AC Generator Protection: Reaffirmed by the Standards Board on 2001 March 17.   |
| IEEE 1344 | Guide Standards for Synchrophasors for Power Systems; Reaffirmed by the Standards Board on 2001 March 17.  |

##### Standards submitted for approval:

- |          |   |
|----------|---|
| C37.90.3 | Standard Electrostatic Discharge Tests for Protective Relays (New Standard); is on the agenda of the Standards Board June 2001 meeting. |
|----------|---|

##### Standards reaffirmations in progress:

- |         |   |
|---------|---|
| C37.112 | Standard Inverse-Time Characteristic Equations for Overcurrent Relays; request for reaffirmation submitted. |
|---------|---|

##### Standards balloting in progress:

- |           |   |
|-----------|---|
| PC37.90.1 | Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems; one negative ballot was received when this standard was balloted. The standard should be submitted for re-circulation with the negative ballot resolved. |
| C37.95    | Guide for Protective Relaying of Utility-Consumer Interconnections; negative ballots have been resolved. To be submitted to the Standards Board for approval.   |
| C37.104   | Guide for Automatic Reclosing of Line Circuit Breakers for AC Distribution and Transmission; balloted - negative ballots are being resolved.  |

##### Standards submitted for balloting:

- |        |  |
|--------|--|
| C37.92 | Standard for Low Energy Analog Signal Inputs to Protective Relays; submitted for balloting.  |
| C37.94 | Standard for N times 64 kilobit per second Optical Fiber Interface between Tele-protection and Multiplexer Equipment; formation of balloting body requested. |

The PARs approved since January 2001, submitted since January 2001, and the PARs for which extension has been applied are as follows. The PARs, which will expire in the near future, are also listed. Applications for extending the lives of these PARs should be filed soon.

PAR approved by NESCOM:

None

##### PAR expirations coming up:

- |         |  |
|---------|--|
| PC37.90 | Standard for Relays and Relay Systems Associated with Electrical Power Apparatus: expires on December 31, 2001 |
| PC37.92 | Standard for low Energy Analog Signal Inputs to Protective Relaying: expires on December 31, 2001              |



- PC37.103 Guide for Differential and Polarizing Circuit Testing: expires on December 31, 2001
- PC37.106 Guide for Abnormal Frequency Protection for Generating Plants: expires on December 31, 2001
- PC37.114 Guide for Determining Fault Location on AC Transmission and Distribution Lines: expires on December 31, 2001
- PC37.115 Standard Test Method for Use in the Evaluation of Message Communications Between Intelligent Electronic Devices in an Integrated Substation: expires on December 31, 2001

PAR extensions applied for:

- PC37.106 Guide for Abnormal Frequency Protection for Generating Plants
- PC37.114 Guide for Determining Fault Location on AC Transmission and Distribution Lines
- PC37.115 Standard Test Method for Use in the Evaluation of Message Communications Between Intelligent Electronic Devices in an Integrated Substation

SUBMITTAL DEADLINES & STANDARDS BOARD MEETING SCHEDULE

|                                 |                         |
|---------------------------------|-------------------------|
| PAR/Standard Submittal Deadline | Standards Board Meeting |
| August 3, 2001                  | June 14, 2001           |
| October 26, 2001                | September 13, 2001      |
|                                 | December 6, 2001        |

Attachments:

PSRC PAR & Standards Status (stds200105.xls)

**Substation Committee Report**

**Tengdin**

The Substations Committee annual meeting was held May 7 –10, 2001 in Tampa. John Tengdin made a presentation to the C0 Subcommittee titled “Genesis of Substation Transients and the Standards That Apply” based on data from Bill Kotheimer. The presentation was made to dispel the notion that SWC and fast transients are not a problem in relay or control houses. Walkie talkie interference was explained. The PSRC environmental standards C37.90, C37.90.1, C37.90.2, and the coming C37.90.3 were described. The PowerPoint presentation is now on the Substations C0 web site.

IEEE 1379 (RTU to IED communications) has been affirmed as a full recommended practice and was published in March 2001. Approval was granted to seek a PAR for a “dot 1” extension (P1379.1) to add the functions of file transfer, virtual terminal, plus DNP and IEC60850-5-104 over TCP/IP.

With input and agreement from a PSRC ad hoc task force, the Substation Committee is proceeding to request balloting for the re-affirmation of C37.2-1996 Device Function Numbers. The PSRC balloting list will be included in the invitation to this electronic ballot.

After many problems at the IEEE Balloting office, we finally were able to start electronic balloting on P1525 on Monday, May 21. The invitation to ballot included all on the balloting lists of PSRC, PSCC, Substations, and SCC36. A total of 92 people signed up to ballot. The balloting will close on June 19, 2001.

The September 2001 PSRC meeting will be joint with the C0 Subcommittee and its working groups of the Substations Committee. This will be the tenth joint meeting (the first was during the reign of John Zulaski and Tony Guiliante in 1992). The Substations Committee will request that a number of their TF and work sessions be held on Monday, September 17 to avoid major conflicts with PSRC scheduling.

**Presentations to the Main Coimmittee**

**Special Presentation- Protection of High-Voltage  
Generators Connected Directly to the Transmission  
Network**

**Lindahl**

**No attachment available**

**WG Report: New Technologies Related to  
Transmission and Distribution Protection**

**Apostolov**

**No attachment available**

**OLD BUSINESS**

None

**NEW BUSINESS**

None

**FUTURE MEETINGS**

|                        |                        |                         |
|------------------------|------------------------|-------------------------|
| September 15-23, 2001: | Madison, WI            | Madison Concourse Hotel |
| January 7-10, 2002:    | Dana Point, CA         | Laguna Cliffs Marriott  |
| May 20-23, 2002:       | Pittsburgh, PA         | Hilton Pittsburgh       |
| September 9-12, 2002:  | Ponte Verdi Beach, FL  | Sawgrass Marriott       |
| January 2003           | Phoenix, AZ-Tentative  |                         |
| May 2003               | Raleigh, NC- Tentative |                         |

**B: ADVISORY COMMITTEE**

**Chair: G.R. Nail**

**Vice Chair: R.P. Taylor**

See Chairman's Report above.

**B1: AWARDS AND TECHNICAL PAPER RECOGNITION**

**Chair: D.J. Novosel**

No Report Received.

**B2: FELLOWS AWARDS**

**Chair: J.S. Thorp**

No activity to report

**B3: MEMBERSHIP COMMITTEE**

**Chair: M.J. Swanson**

No Report Received

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

**Chair: J.C. Appleyard**

No Report Received

**B8: BIBLIOGRAPHY AND PUBLICITY**

**Chair: T.S. Sidhu**

The working group met with four members present. The 2000 bibliography paper has been submitted for publication in the IEEE Transactions on Power Delivery. Assignments for preparing the 2001 bibliography paper were made. A report highlighting the year 2000 activities of the PSRC has been prepared and has been sent to the PES Review for publication. Relay Engineers mailing list will now be maintained along with the PSRC mailing list. Al Darlington will check on the availability of the recent NERC DAWG reports and will review them.

**C: SYSTEM PROTECTION SUBCOMMITTEE**

**Chair: J. S. Thorp**

**Vice Chair: D. Novosel**

The System Protection Subcommittee met on May 24th, 2001 at 1:30 PM in Vancouver, Canada. 53 people attended the meeting, including 14 members.

**C1: SOFTWARE MODELS FOR RELAYS**

**Chair: P. G. McLaren**

**Vice Chair: K. K. Mustaphi**

The WG completed the assignment.

**C2: POWER QUALITY ISSUES IN PROTECTIVE RELAYING**

**Chair: T.W. Cease**

**Vice Chair: David Hart**

C2 met Wednesday May 23, 2001 in Vancouver BC with 15 members and 21 guest present. During the meeting 1 of the guest became a member. There are now 27 members of this working group. It may be necessary to seek a reduction in the number of members. Accomplishments during this meeting: Presentation on IEC and EN Power Quality Standards by Jeffery Yeo of Power Measurement Ltd. Jeffery and Rene will provide a write-up on section 3.4 and 3.5 on IEC and EN standards and impact on and by relays.

Open floor for comments on Pat's' outline of section 4. Discussions included proposal to change title of working group to Protective Devices rather than Relaying to include fuse coordination and reclosers. Electronic draft to be sent out for additional comments due on July 1. Next review in Madison.

Charlie Henville has written a paper on Protective Relays and power quality to be presented at the summer power meeting. Presentation of the paper to the group is planned for Madison.

PQ-DIF (1159-3) standard forwarded by Mike Xavier to TW. 1159-3 describes a standard for exchanging PQ data between different vendors. An electronic copy of this standard can be downloaded at <http://grouper.ieee.org/groups/1159/3/docs.html>

Action Items:

|   |                 |
|---|-----------------|
| Incomplete writing assignments due by June 1    | all             |
| Send remarks to section authors by July 1       | all             |
| Revised section 4 to be sent out for comment    | Pat Carroll     |
| Revised bibliography to be sent out for comment | Tarlochan Sidhu |
| Drafts due end of August to TW and David.       |                 |

### **C3: NEW TECHNOLOGY FOR TRANSMISSION AND DISTRIBUTION PROTECTION**

**Chair: A. P. Apostolov**

**Vice Chair: P. A. Solanics**

Dr. P. Moore gave a presentation "Radio Signals from Arcing Faults for fault Location" at the Main Committee Meeting.

### **C5: DEPLOYMENT AND USE OF DISTURBANCE RECORDERS**

**Chair: B. Jackson**

**Vice Chair: W.M. Strang**

WG met on Wednesday 5/23 for the first time with 18 members and 13 guests.

Discussed our assignment and a preliminary outline. After considerable discussion on the objectives and requirements for the document, it was determined that a revised outline would be prepared and circulated via e-mail to the members for review. The final outline will be distributed at the next meeting.

### **C6: WIDE AREA PROTECTION AND EMERGENCY CONTROL**

**Chair: M. Begovic**

**Vice Chair: D. Novosel**

WG met on May 22 in a single session with 10 members and 8 guests in attendance. Miroslav Begovic reported on the upcoming publication activities of the group members at Bulk Power Dynamics – V Symposium, and HICSS-35 conference. Daniel Karlsson gave a presentation on CIGRE 38.02.19 activities in wide area protection. Daniel is a convener of the CIGRE WG on System Protection Schemes in Power Networks. M. Begovic and D. Karlsson will do documentation and exchange of documents between PSRC and CIGRE. Krish Narendra and J. C. Tan gave a brief presentation on the novel uses of artificial intelligence in power system protection.

The report Draft 6 was reviewed and revised. Existing material and a few late revisions are being added. Comments from Stan Horowitz and Tom Domin were discussed and a few revisions

accepted. After revisions are incorporated into Draft 6.1, it will be sent out for final editing assignments. We expect to complete the report during the Summer of 2001.

**C7: EMTP APPLICATIONS TO POWER SYSTEM PROTECTION**

**Chair: D. Tziouvaras**

**Vice Chair: L. Kojovic**

This WG did not meet in Vancouver. A tutorial will be presented at the IEEE Summer meeting in Vancouver, BC. IEEE plans to make a video of the tutorial during the meeting. This WG completed work.

**C8: PHASOR BASED MODELS FOR ANALYZING RELAY PERFORMANCE Performance**

**Chair: Mike Meisinger**

**Vice Chair: M. S. Sachdev**

The WG met at 9:30 AM on May 22, 2001 with 8 members and 9 guests present.

Draft of Section IV.A, "Pre-application performance analysis of transmission relays" was received after the January 2001 meeting and was incorporated in the document. Draft of Section III.A was received at the meeting and will be incorporated in the paper. Draft of Section III.B.3, "Model Implementation," continues to be outstanding. When received, this section will also be incorporated in the paper.

Juergen Holbach provided a draft on zero sequence compensation. The draft contained too many equations; Juergen agreed to revise the draft and provide it well before the next meeting of the Working Group.

**C9: UNDERFREQUENCY LOAD SHEDDING AND RESTORATION**

**Chair: A. Apostolov**

**Vice-Chair: K. Behrendt**

The working group met on Tuesday, May 22nd, with 15 members and 7 guests present. The working group reviewed the guide's scope, purpose, and outline that were developed at previous meetings. Very few new writing assignments have been received. The outline was reviewed to clarify and confirm commitments for the remaining writing assignments. The chairman will merge the writing assignments into an IEEE formatted document, which will be emailed to the working group members.

Changes and new writing assignments should be emailed to the working group chairman by the end of July. These changes and contributions will be compiled and redistributed by the middle of August, so comments can be received before the September meeting.

All writing assignments shall be submitted in either Word 97 or RTF format with a file name that includes the document section number, revision number, and authors last name (<section\_number\_Rn>\_AuthorsLastName>.zip, or .doc, or .rtf). Figures should be included in the text, and also sent as separate graphic file attachment. References to Figures included in the text should include the name of the Figure.

The scheduled completion date of December, 2001, is questionable at this time.

**C10: EFFECTS ON CHANGING UTILITY ENVIRONMENT ON PROTECTION RELAYING**

**Chair: J. DeLa Re**

**Vice-Chair: R. Hunt**

The working group met 9:30 AM, Wednesday, May 23, 2001 with 20 members and guests. The Chairman distributed copies of the last meeting minutes.

Ed Krizauskas performed a demonstration of the "Survey Said" software, based on an example of the WG I-11 Survey of Relay Test Practices survey. Discussion centered on ensuring the survey produced by this working group can be implemented in this software.

#### Assignments and Action Items

Chair to distribute draft of survey to working group by May 25<sup>th</sup>, 2001.

Members to return comments to survey to Chair by July 15<sup>th</sup>, 2001.

Chair and Vice-Chair to collate comments and distribute results to Working Group prior to next meeting.

### **C11: PROTECTION ISSUES DURING SYSTEM RESTORATION**

**Chair: T. Sidhu**

**Vice-Chair: D. Tziouvaras**

The WG met on May 22, 2001 with 10 members and 30 guests present. Kaylan Mustaphi gave a presentation on restoration issues related to black-start. A number of issues were identified and Kaylan will provide a detailed write-up of his presentation. Outline of the report and issues to be included in the report were discussed. It was agreed that a revised outline will be sent by the chairman to the working group in the next four weeks. Eight writing assignments were made and are due to the chairman by Aug. 10, 2001. These assignments will be discussed at the September meeting.

#### Liaison Reports:

### **IEEE PES Power System Stability Controls SC to the PSRC** , Gary Michael

The Subcommittee met January 30, 2001 in Columbus with around 60 members and guests attending. Following the business meeting, the SC sponsored a morning technical paper session with three transactions papers and two proceedings papers. In the afternoon, the SC sponsored the panel session Fast-Acting Load Control for System and Price Stability. The panel session was of high interest, with attendance of 80-plus.

On January 29, the SC co-sponsored the panel session Maximizing Benefits of Generator Temporary Overexcited Capability. Papers from both panel sessions are available to subcommittee and committee members at <http://www.transmission.bpa.gov/orgs/opi/index.shtm> under IEEE Power System Stability Controls Subcommittee.

The Power System Dynamic Measurements WG chaired by Dick Schulz is preparing the paper "Preferred Capabilities for Power System Dynamics Measurements."

The SC is forming a Task Force on Fast-Acting Load Control for System and Price Stability. Jeff Dagle is chairman. A position paper is planned, along with a second panel session at the 2002 WM. The idea is to take advantage of current need for direct load control/real-time pricing for demand management and consumer price-based load reduction. With appropriate design, the same infrastructure can be used for stability control, especially longer-term voltage stability.

The SC is also forming a new Task Force on Tests Systems for Stability Controls. Ian Hiskens is chairman.

At the Vancouver 2001 SPM, the SC is planning a panel session on Recent Experience with Emergency Stability Controls. Panelists are from Hydro Quebec, Bonneville Power Administration, CEPTEL-Brazil, Power System Emergency Control Laboratory-Russia, and Iowa State University. The session will include implementations following major disturbances, and use of PLC and other digital controls. Members are participating in two new CIGRE task forces: TF 38.02.23, Coordinated Voltage Control in Transmission Networks, and TF 38.02.24, Defense Plans Against Extreme Contingencies. Possible new work includes emergency voltage stability controls, stability controls in the new industry environment, PSS tuning guide with emphasis on new equipment and inter-area oscillations, and stability controls for power electronic devices.

**NERC Liaison Report to SC** , Phil Winston

Nothing major to report.

**D: LINE PROTECTION SUBCOMMITTEE**

**Chair: R.M. Westfall**

**Vice Chair: Mark Carpenter**

The Line Protection Subcommittee met in Vancouver, Canada on May 23, 2001 with 17 members and 29 guests present and Chairman Ron Westfall presiding. The minutes of the Austin, Texas meeting were approved.

**D1: EFFECTIVENESS OF DISTRIBUTION PROTECTION**

**Chair: P. Carroll**

**Vice Chair: C. Fink**

The working group met with 8 members and 15 guests. After introductions and approval of the January meeting minutes, the Chairman reviewed the scope and status of our assignment. In particular, we have received only 32 responses out of 200 mailed out. The working group agreed that it would be appropriate to personally contact mailing list recipients in an effort to increase the number of survey responses. The working group then reviewed the mailing list and made approximately 120 contact assignments. Recipients will be asked to return completed surveys by August 1.

**D2: FAULT LOCATING**

**Chair: Karl Zimmerman**

**Vice Chairman: Damir Novosel**

Working Group D2, Fault Locating, met in a single session with 7 members and 11 guests. The final document draft is in the process of WG/SC balloting. Ballots are due by June 1. The working group has received one negative ballot with comments and one positive ballot with comments. Those ballots were resolved at the meeting with the following actions to be taken:

Correct all instances written in first person by writing them in third person. In addition, proofread the document one more time. Tony Seegers is responsible for this item.

Correct velocity of propagation to correct speed of light.

Check if reference A22 is available to the public. If it is not available, take it out. If it is available on the Web, list the website where it can be found.

Correct date of publishing for Ref. A29 (1996 to 1996).

Herb Jacobi will add in his ballot comments to the traveling wave chapter.

After all ballots are received on June 1, the chairman will distribute the document, with clearly marked changes, to verify that ballots are resolved.

It is planned to submit the document for balloting before the September meeting.



### **D3: IMPACT OF DISTRIBUTED RESOURCES ON DISTRIBUTION RELAY PROTECTION**

**Chair: Tony Seegers**

**Vice Chair: Ken Birt**

Working Group D3 met in a single session on Tuesday, May 22, 2001. This was the first meeting of this working group. 11 people signed up as members of the working group; another 13 guests were present at the meeting.

The working group will produce a special report to the line protection subcommittee for publication on the website. The report will be submitted for presentation at selected regional conferences. The targeted final completion date is May 2004.

The paper will explore the effect of distributed resources (DR) on the protection and control of the largely radial distribution systems. Monitoring requirements for power quality and system operation will also be considered.

The DR/utility interface protection and the DR generation protection are covered in other documents. This paper will focus on the protection and control at the substation. Topics to be included are coordination of the feeder relays, reclosers and fuses, reclosing practices and substation automatic throwover practices. The paper is intended to identify problems and choices for solutions.

DR can be three phase or single phase generation. Differences between synchronous generators, induction generators and static inverters need to be considered. Problems associated with multiple DR installations on a single feeder need to be considered.

### **D4: AUTOMATIC RECLOSING**

**Chair: W.M. Strang**

**Vice Chairman: Mal Swanson**

The working group met on May 22, 2001 with 23 members and 22 guests.

Before the meeting, balloting results were compiled and reviewed by selected members. From the 320 comments, 38 were reviewed by the membership.

Bill Strang will prepare the formal responses and start the process for recirculation.

## **D6: TRANSMISSION LINE PROTECTIVE SYSTEMS LOADABILITY**

**Chair: Tony Seegers**

**Vice Chairman: Ed Krizauskas**

The meeting was held in a single session on Tuesday morning with 6 members and 8 guests in attendance.

The paper has been entered on the PES-PSRC website in a zipped .rtf file, and is available to download at anytime.

### **Regional Conferences:**

Georgia Tech – Barry Jackson presented the paper at Georgia Tech.

Texas A&M - Don Sevcik will submit the paper for presentation in 2002.

ECNE - Tony Napikoski will present the paper.

Western – The paper is on the agenda for the 2001 conference. Charlie Henville will be the presenter.

MIPSYCON – The paper is on the agenda for the 2001 conference. Roger Hedding will be the presenter.

Energy Assn. of PA – The paper has been submitted for the fall 2001 meeting. If accepted, Ed Krizauskas will be the presenter.

### **Editorial Team:**

Tony Seegers thanked the Editorial Team for their efforts in finalizing the paper. The Editorial Team consisted of Tony Seegers, Dave Jamison, Dan Hamai, Dean Miller, Bill Lowe and Ed Krizauskas.

Tony adjourned the meeting and the working group.

## **D10: EMTP REFERENCE MODELS FOR TRANSMISSION LINE RELAY TESTING**

**Chair: Mustaphi**

**Vice Chair: T.Sidhu**

The working group met on Tuesday, May 22, 2001 with 6 members and 7 guests in attendance. Draft #1, which was sent earlier to the members, was reviewed and discussed. The members agreed that the write-up should be centered on Figure 1. A couple of components were added to the figure. Each section in the draft will define the components in the figure related to that particular section. Write-ups on a few missing sections will be included in Draft #2. Members will send their write-ups to the chairman by July 31, 2001.

## **DTF1: IEEE GUIDE FOR PROTECTIVE RELAY APPLICATIONS TO DISTRIBUTION LINES**

**Chair: Phil Waudby**

The task force met with 19 attendees to discuss the formation of a WG to write the guide.

Several ideas were discussed. The Task Force decided to pursue a PAR with the following scope:

"Write a guide for the application and coordination of protective relays to power system distribution lines. Describe the fundamentals, line configurations and schemes. Identify problems and describe solutions associated with various methods employed in distribution line protection."

### **Old Business:**

None

### **New Business:**

Elmo Price was added to the Subcommittee.

## **H: RELAY COMMUNICATIONS SUBCOMMITTEE**

**Chair: M. S. Simon**

**Vice Chair: K. J. Fodero**

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

**Chair: B. Nelson**

**Vice Chairman: M. Simon**

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

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

### **H2: PROTECTION USING SPREAD SPECTRUM COMMUNICATIONS**

**Chairman: Ken Behrendt**

**Vice Chair: Bill Lowe**

The working group met in a double session. The first session, held Tuesday, May 22<sup>nd</sup>, with 11 members and 41 guests present, included a presentation by Tom Dideum, Freewave Technologies, Inc., about spread spectrum radio technologies. Freewave Technologies is developing spread spectrum radio firmware optimized for point-to-point protection applications.

The second session, held Wednesday, May 23<sup>rd</sup>, with 13 members and 13 guests, was used to further develop a document outline. The working group will prepare a working group report, which will be published on the PSRC web site. The H5 working group report on peer-to-peer

communication will be used to provide selected protective relay scheme requirements for the H2 report.

The working group plans to meet in double session at the next PSRC meeting. The first session will be used for a presentation, and the second for continued work on the proposed working group report. A room for 40, with a projector screen and a power strip is needed.

Reference:

The revised H2 working group report title and assignment are as follows:

Title: Using Spread Spectrum Radio Communication for Power System Protection Relaying Applications

Scope:

This project will develop a working group report for the application of protective relays using spread spectrum radio communication for power system protection schemes. It will present background information, bibliography, and recommendations. It discusses spread spectrum radio communication technologies and topologies that may be applicable for use in protective relay schemes. It discusses practical considerations of interfaces, interoperability, reliability ( security and dependability) availability, security against intrusion, and economics for spread spectrum radio communication..

Purpose:

There is currently no IEEE document describing the application of protective relays using spread spectrum radio communication. Protective relaying and spread spectrum radio communication technologies are rapidly changing and expanding. Understanding the opportunities and limits of these technologies is important to their successful mutual application. This document will be coordinated with the Audio Tone Guide to minimize duplication of effort. This document will provide information to assist in the application of spread spectrum radio communication technologies for protective relay schemes. Descriptions of some working systems and their performance will be provided.

Traditional microwave radio communication, and other evolving wireless communication, such as infrared communication, was considered for inclusion in this document, but it was agreed that their inclusion would expand the scope of the document beyond a manageable level. These subjects may be of interest for future working group assignments.

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

**Chair: D. Holstein**

**Vice Chair: Eric Udren**

Fourteen members and guests were present. John Tengdin – Vice Chairman conducted the meeting, as the Chairman

– Dennis Holstein was unable to attend

Announced that the two year PAR extension to 2002 has been granted.

Although the original agenda for this meeting included an item – “Discussion of Comments on P1525 balloting” – this item was dropped, as the balloting on P1525 just began on May 21, 2001. It will close at 11:59 pm Eastern time on Tuesday, 19 June 2001.

John Tengdin presented the status of the seven PC37.115 documents, all of which are posted on the H4 web site. They are the base document, and six annexes. Annex A is normative; the other five are annexes are informative examples which were developed as extensions to the work of WG H5. All are very stable, with only minor changes to one annex since the January meeting, and are ready for ballot.

Tengdin reviewed the entities identified for coordination on the original PAR. They are:

- PES Substations Committee,
- PES Power System Communications Committee, and
- PES Transmission & Distribution Committee.

It was agreed by the WG that the balloting pools of these Technical Committees plus PSRC will be invited to ballot PC37.115.

It was agreed to ask the Relaying Communications Subcommittee for authority to proceed with the balloting. Electronic balloting will be requested.

There being no other items of old or new business, nor general discussion, the meeting was adjourned at 10:00 AM so that those interested could attend the meeting on relay firmware.

#### **H5: Application of Substation Peer to Peer Communications**

**Chair: M. Yalla**

**Vice Chair: M. Adamiak**

The working group met with 6 members and 16 guests on Tuesday. The draft number 1 of the transactions paper was reviewed and some minor changes proposed. The working group chairman will revise the draft and submit it to the PSRC officers for approval. After getting the approval the paper will be submitted to the IEEE for publication in the transactions. The paper will also be submitted for presentation at the PES or PSRC meeting.

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

**Chairman: John Burger**

**Vice Chair: Charlie Sufana**

H6 met on May 22, 2001, in a single session with 8 members and 26 guests with Chairman John Burger presiding. The minutes from the Austin meeting were read and approved with no changes.

John reminded everyone who had writing assignments to get them into him or Charlie Sufana as soon as possible. He also thanked those who are already provided material.

Kay Clinard then gave an update on IEC 61850 and handed out a roadmap of 61850. Various parts are out for Committee Draft Vote (CDV). The parts of 61850 of most interest to this working group; sections 7-1, 7-2, 7-3, and 7-4 are expected to have the CDV completed by mid August of this year. The Final Draft International Standard (FDIS) is expected to be issued the first of November of 2001. Kay said that GOMSFE .92 is to be posted this week; the web address is

<http://www.ucausersgroup.org>. Sometime in 2002 there may be the international standard. Mark Adamiak said that the IEC has a new version of GOOSE (a Gander). He indicated that the IEC adopted the existing UCA GOOSE format; meaning any device must be able to read a UCA GOOSE message. However, the DNA bits are now user definable.

John Burger next gave a short talk on the new AEP Orange 765kV station using UCA. He also indicated the AEP Marysville station is also on the WAN. The stations have multiple redundancy. John Tengdin asked if there is a firewall; there is no firewall. The stations use 10MB speed and the hubs are not switchable. GOOSE has not been implemented, so there is not really any protection traffic handled. Each DFR has a GPS receiver and each USI DFR can send out the timing synch. SCADA data is coming from the HMI/PC.

The working group then discussed some of the writing assignments and future additions. Dan Nordell will add some more history to the Intro to UCA that Michel Toupin developed. The target timeframe for completion of the paper is next year. It was decided to add something about IEC 61850. Steve Kunsman has a paper on the harmonization effort and will forward that on.

Charlie Sufana gave a short discussion on GOOSE. Mark Adamiak will write up a paper on actual GOOSE usage so that an actual station can be included.

John Burger then gave a handout on the HMI-linking and what you can do with the mmi, i.e. databases.

John Whatley next talked briefly on user testing. A central question is how would one run a station fully committed to GOOSE. SLAM is being developed. He will be talking at the UCA meeting. Mark Adamiak asked how is the test bit to be used; that is something that will have to be further discussed. Jim also indicated that there is a need for security at the object type.

John Burger closed the meeting by asking for assignment papers to be returned within 6 weeks. He also invited everyone to come to the UCA meeting later in the week. There will be 18 vendors at the UCA meeting. Gallery 2 is to be the location. John Tengdin reminded everyone that the UCA meetings are open to anyone.

#### **H7: PC37.94 INTER RELAY COMMUNICATION PROTOCOL STANDARD**

**Chair: G. Michel**

**Vice Chair:**

H7 did not meet as there work is done. The group is waiting for the chairman to submit the new standard for balloting.

#### **H8: FILE NAMING CONVENTION FOR TIME SEQUENCE DATA**

**Chair: Jim Ingleson**

**Vice Chair: Mark Taylor**

Summary: No changes were made to the filename at this meeting, only some minor improvements in the report. The working group is ready to present a report to the main committee, and we ask for permission to make this presentation at the September meeting.

Six members and four guests were present.

Copies of the Working Group Report, Rev. 3.2, were distributed.

There were no comments on the minutes of the last meeting.

There was discussion of the instrument code. This code is open to the user, that is, there is not a standard method for assigning this code. After discussion, it was agreed that we will leave this code open to the user.

There is a problem with the time code section in that it does not allow enough characters. Those few users who live in a time zone which differs from UT by a non-integral number of hours will have two options: either use UT or express the difference as a decimal, for example “-3.5s.” The group agreed that it would be all right to have a period within the filename.

The paragraph on start will have additional explanation of the format and will include a statement that the start time can be specified to whatever precision desired.

The Chairman will seek permission of Subcommittee H to make a report to the main committee at the September meeting.

Unless something important comes up, this working group will not meet at the September PSRC meeting.

#### **H9: Special Considerations in Applying PLC for Protective Relaying**

**Chair: M. Sanders**

**Vice Chair: M. McDonald**

H9 Working Group met in a single session on May 23, 2001 with 3 members and 6 guests. Draft 5 of the special paper was distributed. The draft was reviewed and several topics were assigned to be expanded as well as additional assignments for the existing topics. The writing assignments are due to the chair by August 15, 2001.

The chair will forward draft 6 electronically to the members. One member was added to the working group.

The chair requests that the expected completion date be changed to 2002 as the paper is still in need of additions and revisions.

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

**Chair: Bill Higinbotham**

**Vice Chair: Jerry Hohn**

H10 met on Wednesday May 23, 2001 in Vancouver BC. The meeting was chaired by Mark Simon in the absence of the Chair and the Vice-Chair.

The group reviewed draft 5. Minor adjustments were made with the working

group members being asked to finalize their audit of the document in Preparation for ballot.

### **H11: REVISION TO THE SYNCROPHASOR STANDARD**

**Chairman: K. Martin**

**Vice Chair:**

Working Group H11 met at 8:00 am on Wednesday, May 23. Fourteen members and nine guests were present.

The section on "Synchronization" was discussed. The requirements for resynchronization will be removed from the Standard. These issues will be discussed in Annex C. The text in Section 5.5 will be edited to correctly show the exponents in the formulas. References to IEEE Standards and IEC Standards will be updated.

The format for the Data Frame was discussed. There was agreement to include separate fields for both "Sample Count" and "Microsecond of Second" in the Standard.

Techniques to address the filtering delays in the timed data were discussed. Aliasing issues, signals at off-nominal frequency, and the one microsecond synchronization accuracy were also discussed. Members agreed to writing assignments on these topics.

### **Task Force Reports**

#### **HTF1: SWITCHYARD DATA ACQUISITION**

**Chair: E. Udren**

HTF1 was not scheduled to meet, and will be scheduled when we have available a clear presentation of the status of IEC 61850-9-2, process bus communications still under development.

IEC 61850-9-1, uni-directional serial point to point link, was presented to the task force nearly two years ago and is in the later stages of IEC standards voting process.

### **Liaison Reports**

#### **Power System Communications Committee - E. A. Udren**

The PSCC met at the Summer Power Meeting in Seattle.

The Power Line Carrier Subcommittee continues writing and editorial work on the nearly complete IEEE 643, Carrier Application Guide. This is the document for which the PSRC has submitted three sections related to relaying requirements. The next draft at the Winter Power Meeting in Columbus should be ready for SC ballot.



The Radio Subcommittee has submitted for publication a Transactions Paper entitled Communications Technology Guidelines for EMS/SCADA Systems. Their next project is a mobile computing survey of 75 electric utilities.

The Wire Line Subcommittee reports the following status for standards under its review:

- IEEE 487 - 1992, Protection of Wire Line Facilities Serving Electric Power Stations – balloting results to be reviewed in Columbus.
- IEEE 776 – 1992, Inductive Coordination of Electric Supply and Communication Lines – reaffirmed by Standards Board 1998.
- IEEE 820 – 1984, Telephone Loop Performance Characteristics – reaffirmed 1999.
- IEEE 1137-1991, Inductive Coordination Mitigation Techniques – reaffirmed 1998.

Other Subcommittees have not reported minutes from Seattle. The next meeting occurs in Columbus in February 2001.

### **Substation Committee - J. Tengdin**

Substations Committee Liaison Report to PSRC – 5/23/01

The Substations Committee annual meeting was held May 7 –10, 2001 in Tampa.

IEEE 1379 (RTU to IED communications) has been affirmed as a full recommended practice and was published in March 2001. Approval was granted to seek a PAR for a “dot 1” extension (P1379.1) to add the functions of file transfer, virtual terminal, plus DNP and IEC60850-5-104 over TCP/IP.

With input and agreement from a PSRC ad hoc task force, Substations is proceeding to request re-affirmation of C37.2-1996 Device Function Numbers.

After many problems at the IEEE Balloting office, we finally were able to start balloting on P1525 on Monday, May 21. The invitation to ballot included all on the balloting lists of PSRC, PSCC, Substations, and SCC36. A total of 92 people signed up to ballot. The balloting will close on June 19, 2001.

The September 2001 PSRC meeting will be joint with the C0 Subcommittee and its working groups of the Substations Committee. This will be the tenth joint meeting (the first was during the reign of John Zulaski and Tony Guiliante in 1992). Substations will request that a number of their TF and work sessions be held on Monday to avoid major conflict with PSRC scheduling.

### **IEC TC 57 - Teleprotection and Power System Control** - E.A. Udren

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

Through many meetings during 2001, the WGs carried out voting cycles and draft revisions of sections of the massive standard, leading to a current CDV voting cycle on key sections of the document. The work is in its sixth year, and WG leaders/editors are now under massive pressure from the IEC Central Office in Geneva to get the work finished, or face termination of the project.

**SCC 36** - D. Holstein

Nothing reported at this meeting.

Coordination Reports

**C93 - Liaison Report on ANSI C93 Committee** - Roger Ray

At the present time the C93 Committee is not meeting. The committee has held a letter ballot, asking if the committee wants to move the secretariat function to the IEEE. The results of that ballot was unanimous to move the C93 Committee under the umbrella of the IEEE. We are presently awaiting a letter from NEMA, the present secretariat, giving IEEE the rights to all of the C93 standards.

**I: RELAYING PRACTICES SUBCOMMITTEE**

**Chair: Jeff Gilbert**

**Vice Chair: Jim Ingleson**

The Relaying Practices Subcommittee (SC) met on May 23, 2001, in Vancouver, BC. A total of 16 members and 26 guests attended. Minutes of the previous January 2001 meeting were approved. The following reports were submitted to the Vice Chair for inclusion in the minutes.

**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**

No meeting was held and no report was submitted.

**I2: TERMINOLOGY USAGE REVIEW**

**Chair: Mal Swanson**

**Vice Chair: J. D. Huddleston, III**

Lists 1, 2, and 3 are due to be published. List 4 will be submitted for balloting. List 5 was discussed and changes will be documented for mailing to members in a month.

**I4: IEC STANDARDS ADVISORY**

**Chair: Eric Udren**

**Vice Chair: M. M. Ranieri**

The working group discussed the one voting document requiring USNC response, which is "95/122/CD - 60255-22-1 - 1 MHz Burst Test". This is a revision of the prior 1988 version. The WG compiled about ten comments of substance for the IEC WG.

**I5: TRIAL-USE STANDARD FOR LOW ENERGY INPUTS TO PROTECTIVE RELAYS**

**Chair: Eric Udren**

**Vice Chair: Peter McLaren**

The working group has submitted the draft Standard to IEEE again for the balloting process, which should begin shortly. Because of the normal delays in dealing with ballot responses, the Standards Coordinator has recommended that the PAR be extended.

**I6: REVISION OF C37.90 - STANDARD FOR RELAYS AND RELAY SYSTEMS ASSOCIATED WITH ELECTRIC POWER APPARATUS**

**Chair: Mario Ranieri**

**Vice Chair: James Teague**

Cliff Downs led the meeting in the absence of the chairman. Draft 12 of the revised standard was reviewed in preparation for submission for balloting. The chairman will poll all working group members regarding the changes so that the document can be submitted for balloting.

**I7: ELECTROSTATIC DISCHARGE TESTING FOR PROTECTIVE RELAYS**

**Chair: J. Teague**

**Vice Chair: M. S. Simon**

No meeting was held and no report was submitted.

**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**

The working group agreed to re-circulate the latest revision of draft 7 which includes changes which resolve the negative ballot. The chairman will develop a list of changes made to draft 6 and submit the necessary documents to IEEE headquarters to initiate re-circulation.

**I9: REVISION OF C37.105 - STANDARD FOR QUALIFYING CLASS 1E RELAYS AND AUXILIARIES FOR NUCLEAR POWER PLANTS**

**Chair: Subinoy Mazumdar**

**Vice Chair: Sahib Usman**

A draft, formatted to the latest IEEE Standard Style Manual has been prepared and discussed. Several changes have been discussed and agreed to.

**I10: REVISION OF C37.98: STANDARD FOR SEISMIC TESTING OF RELAYS**

**Chair: Mason Clark**

**Vice Chair. Munnu Bajpai**

No meeting was held and no report was submitted.

**I11: RELAY TEST PRACTICES SURVEY**

**Chair: Ed Krizauskas**

**Vice Chair: Bill Lowe**

77 responses have been received to date. The working group has produced Draft 2 of the survey report. The chairman will update the results received by August 1 and send to the authors of each section. The authors will then update their sections and send them to the chairman who will then

issue Draft 3 to the working group by September 1, for discussion at the September PSRC meeting.

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

**Chair: Mike Meisinger**

**Vice Chair: Don Sevcik**

A presentation was given by a manufacturer on a method for field testing (ratio, polarity and phase angle) of wound type or optical current transformers using high current test source or in service current. This and other test methods were debated. Draft #1 of Revised Guide is being developed.

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

**Chair: Moh Sachdev**

**Vice Chair: Brian Mugalian**

Brian Mugalian reported that he had contacted some respondents to the survey for clarification. He had received one clarification that was placed before the WG. It was decided to include the special case in the guide. The summary of the responses will be provided to the respondents. The task of preparing drawings for the guide was reviewed. Al Darlington agreed to start preparing the Visio drawings as they are provided to him.

**I14: TELECOMMUNICATION TERMS/NEW TERMS USED BY PROTECTION ENGINEERS**

**Chair: Tim Phillippe**

**Vice Chair: Ray Young**

Roger Ray presented a tutorial on fiber optics. At the next meeting Mark Adamiak will do a presentation on ethernet basics.

**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**

The group reviewed a "CT Saturation Calculator" program. The working group will review draft 2 and will provide comments by July 20, 2001. The comments will be incorporated in draft 3 which will be sent to the members for the September 2001 meeting.

**I16: UNDERSTANDING MICROPROCESSOR BASED TECHNOLOGY APPLIED TO RELAYING**

**Chair: M. Sachdev**

**Vice Chair: R. Das**

The working group met, however no report has been submitted at this time.

**I17: TRENDS IN RELAY PERFORMANCE**

**Chair: Mark Carpenter**

**Vice Chair:**

The relay performance of 5 utilities was covered. Additional utility information will be gathered prior to the September meeting.

**I18: C37.90.2 WITHSTAND CAPABILITY OF RELAY SYSTEMS TO RADIATED ELECTROMAGNETIC INTERFERENCE FROM TRANSCEIVERS**

**Chair: Jeff Burnworth**

**Vice Chair: Bill Higinbotham**

The working group discussed available test data, test wave forms and application differences between C37.90.2 and IEC 60255-22-3. Test data will be acquired on portable wireless phones. Writing assignments will be identified and assigned through correspondences, prior to the next meeting.

**I19: ANALYSIS OF SUBSTATION DATA**

**Chair: L. Smith**

**Vice-Chair: Bruce Pickett**

No meeting was held and no report was submitted.

**TASK FORCE REPORTS:**

**ITF1: RELAY SERVICE LETTER DATABASE**

**Chair: J. Ingleson**

No new letters have been received since the last meeting.

**ITF2: RELAY FIRMWARE**

**Chair: J. Whatley**

**Vice-Chair: R. Beresh**

The initial meeting was held. There was general agreement that there is a need to proceed with this topic. The results of a literature search will help to refine the scope.

**LIAISON REPORTS:**

**INSTRUMENT TRANSFORMERS SUBCOMMITTEE OF THE PES TRANSFORMERS COMMITTEE** - Jim Huddleston

Document C57.13.5 is now shown as C57.13.05/D14 "Draft of Trial-Use Guide of Test Requirements for Instrument Transformers Rated 115-kV Nominal System Voltage and Above." This document was circulated to the SubCommittee members for consensus, including me, with comments due by April 11, 2001. The document increases the stringency of tests applied to this class of Instrument Transformers, and looks quite close to Ballot. PSRC does not have coordination.

**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.

**COORDINATOR'S REPORTS:**

**P384-NPEC, IEEE STANDARD CRITERIA FOR INDEPENDENCE OF CLASS 1E EQUIPMENT AND CIRCUITS** - Munni Bajpai

No activity to report.

**REVISION OF C57.13-1993 IEEE STANDARD REQUIREMENTS FOR INSTRUMENT TRANSFORMERS** -Jim Huddleston

This document was submitted to the SubCommittee members for comments along with the C57.13.05 document. It appeared to be a re-statement of the existing Standard, but with an unknown PAR expiration date. According to the statements in the Nashville Minutes, the PAR was extended through December, 2000, and that date has expired.

**PROPOSED C57.13.6 INSTRUMENT TRANSFORMERS FOR USE WITH ELECTRONIC RELAYS AND METERS** - Jim Huddleston

This document continues to evolve with minor deletions and improvements. Changes agreed to at Nashville should have been incorporated in time for the Niagara Falls meeting.

**OLD BUSINESS:**

**NEW BUSINESS:**

The chairman and the Subcommittee expressed their appreciation to Larry Smith for his contributions as Member and Vice-Chairman of the Subcommittee. Beginning at this meeting, Jim Ingleson will be the new Vice-Chairman. Jim asked that all working group, task force, coordinator, and liaison reports be submitted at the Subcommittee meeting. This will make it possible to post the subcommittee minutes immediately after the meeting.

**J: ROTATING MACHINERY PROTECTION SUBCOMMITTEE**

**Chair: R.D. Pettigrew**

**Vice Chair: S. P. Conrad**

The subcommittee met on May 23, 2001 with 12 members and 6 guests present. Minutes of the January 2001 meeting in Austin, TX were approved. Advisory Committee items of interest are in the main committee report.

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

**Chair: G. Benmouyal**

**Vice Chair: E. Fennell**

Did not meet. Informal Ballot is out for subcommittee/WG.

**J2: AC MOTOR PROTECTION TUTORIAL**

**Chair: S. Zocholl**

**Vice Chairman: P. Kerrigan**

The WG met with two members and eight guests. The tutorial is now complete and was presented to 29 attendees at the Texas A & M Protection Relay Conference. The tutorial consists of four separate Powerpoint presentations each having speaker notes which will be posted on the PSRC web site.

The presentations are:  
Motor Dynamics and Analysis

C37.96 Motor Protection  
Microprocessors Thermal Protection  
Thermal Models of a Generic Thermal Limit Curve

The work of the WG is now complete.

**J4: REVISION OF C37.102 AC GENERATOR PROTECTION GUIDE**

**Chair: M. Yalla**

**Vice Chair: K. Stephan**

This meeting of Working Group J4, IEEE Guide for AC Generator Protection was held on Tuesday, May 22, 2001 with 12 members and 15 guests present.

Five writing assignments were reviewed. These included identifying places in the present guide that need work to incorporate the advantages of new protection technology such as multi-function digital relays, acknowledging protection of gas turbines, additional information on sequential tripping, additional schemes used elsewhere in the world, and an updated bibliography.

The group also discussed a dual high/low impedance stator ground protection scheme, protection of modern gas turbines with LCI (load commutated inverters), and low forward power protection.

Eleven people accepted writing assignments.

Mike Reichard joined the Working Group.

**J6: PERFORMANCE OF GENERATOR PROTECTION DURING SYSTEM DISTURBANCES**

**Chair: S. Patel**

**Vice Chair: K. Stephan**

WG J6 met on Wednesday in a single session with 13 members and 11 guests.

The working group reviewed the comments received from a "ballot" of the WG members. Major topics of discussion included expanding explanations of applying 51V relays to include the differences and considerations of using voltage controlled vs. voltage restrained overcurrent relays, setting 21 distance relay's reach to prevent misoperation, under voltage blocking of frequency relays, and methods to decrease the size of the paper.

Two writing assignments were made.

**J7: REVISION OF C37.101, GENERATOR GROUND PROTECTION GUIDE**

**Chair: J. Uchiyama**

**Vice Chair: R. Das**

The WG met in a single session on May 23, 2001 with 10 members and 8 guests present.

Chairman opened the meeting and copies of the January meeting minutes (Austin, TX), and assignments received from Rai Martilla, Wayne Hartman, Mike Reichard, Sahib Usiman, Jon Gardell and Chuck Mozina. WG reviewed and discussed these papers.

The assignments will be due by August 15, 2001.

## Task Force Reports

### **JTF1: PROTECTION OF SMALL INTERCONNECTED GENERATORS**

**Chair: E. Fennel**

**Vice Chair:**

Committee did not meet.

### **JTF2: SETTING OF GENERATOR PROTECTIVE RELAYING**

**Chair: C. Mozina**

**Vice Chair:**

The first meeting of the JTF2 Committee was held on Tuesday, May 22, 2001 with 24 people in attendance. The TF reviewed the proposed Scope of Developing a document that discussed the relay setting criteria and calculation methods for the typical compliment of relays used to protect synchronous generators. The general consensus of the TF was that the scope was much too broad to be accomplished in a timely fashion due to the number of different protection schemes for each protective function, various setting philosophies and effects of various prime movers. After considerable discussion, it was decided to reduce the scope to an area that most concerns the industry ---i.e. the coordination of generator relay settings with generator control. The area of coordinating of generator relay settings with generator excitation control is of particular interest. The next TF meeting will explore a specific scope along the lines cited above and propose it to the subcommittee.

## Liaison Reports

### **Electric Machinery Committee**, C. J. Mozina

They met at the Winter Power meeting and not much to report.

## Coordination Reports

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

The Working Group met at the Winter Power Meeting in Columbus, OH in January 2001 to discuss and review the ballot results of Draft #6. The writer attended and participated in this meeting. All comments were reviewed and a resolution of each was developed. A new draft of the document will be developed containing these resolutions and prepared for the formal IEEE ballot process. This previous ballot was only an informal Working Group member's ballot to develop a group consensus.

### **P408-NPEC, Standard Criteria for Class IE Power Systems for Nuclear Power Generating Stations**, K. J. Khunkhun

No report.

### **P1010, Guide for Control of Hydroelectric Power Plants**, W. Hartmann



Spoke with John Yale (Liaison) Still in review process. They believe they will have materials for our review by the summer of 2001.

I will contact Post-meeting for Update.

### **Old Business**

No old business.

### **New Business**

Chuck Mozina proposed that the Generator Protection tutorial should be given again. Chuck will contact Power Gen and other possible venues.

General Discussion and Interesting "In-Service Aberration"

1. Chuck Mozina described an inadvertent energizing in Georgia. This happened due to inadvertently energizing the closing coil of the breaker.
2. Chuck Mozina described an operation of loss of field relay during a test for low excitation condition.

Please contact Steve Conrad- Vice Chairman – to arrange for presentations.

### **K: SUBSTATION PROTECTION SUBCOMMITTEE**

**Chair: S. R. Chano**

**Vice Chair: C. R. Sufana**

The Subcommittee met in Vancouver, BC on May 23, 2001, with 11 members and 14 guests present. The minutes of the previous meeting in Austin, TX were approved with a correction indicating that K7 is a working group instead of a task force. Minutes were approved with the modification.

### **K4: BUS PROTECTION GUIDE**

**Chair: S. P. Conrad**

**Vice Chair: R. W. Haas**

The chair nor the vice chair was able to attend. Simon will check to make sure the the final document is being sent to HQ.

### **K5: NETWORK TRANSFORMER PROTECTION GUIDE**

**Chair: C. R. Sufana**

**Vice Chair: A. P. Napikoski**

Working Group K5 met in a single session with 4 members and 5 guests attending. After introductions were made, the previous meeting's minutes were approved as presented.

Discussion then centered on the status of the latest draft, which is draft 11. Charlie Sufana indicated that the latest draft is hopefully the final version.

Charlie Sufana also indicated that almost all of the 7 negative ballots have been cleared. He indicated that he has tabulated all of the negative ballots and that the document will accompany the latest draft when it is returned to the IEEE. He is currently waiting on a reply from several of the negative balloters.

The working group was asked to check their company standards to resolve the correct location of the blade of the grounding switch located on the high voltage side of the transformer. Figure 1 originally had the switch on the line side and agreed with figure B1. The latest version has the blade on the transformer side as suggested by Steve Conrad.

The group then addressed the P1547 Distributed Resources Guide draft 07 changes. There were numerous negative ballots to the standard in the area of our interest section 4.14 as well as other parts of the draft.

There was also discussion of the need for a summary paper. The working group decides to write a summary paper. Charles Sufana indicated he would distribute copies of the previous summary paper for review by the members. Everyone is to provide suggestions of what to include in the summary.

The working group will be meeting in a single session for 10 at the September 2001 meeting and requests no overhead. It is anticipated that the IEEE HQ will be receiving the latest draft and cover letter by mid June.

## **K6: SHUNT CAPACITOR PROTECTION GUIDE TUTORIAL**

**Chair: Pratap A. Mysore**

**Vice Chair: Roger Hedding**

In the absence of Chairman Pratap Mysore, Roger Hedding chaired the K6 meeting which met Tuesday morning with 4 members and 8 guests. The tutorial powerpoint presentation was reviewed. Although the slides were very informative and well done, it was the general consensus of those present that some slides contained too much information. Simon Chano will edit the slides and send them to the working group for further comment.

Jointly with the Capacitor Subcommittee of the T & D Committee, a panel session will be held at the October T & D Conference. The WG has been contacted for participants in the panel session. The subject was brought up at the meeting for members to participate in the scheduled regional conferences.

The tutorial is also scheduled for the Minnesota Power System Conference in November (12 and 13) of this year. Other possible venues that will be explored are: Georgia Tech, Texas A & M, Western Protective Relay Conference, The Energy Association of Pennsylvania, Mexico, the IEEE T&D show, and the Electric Council of New England. All of the venues are proposed for 2002. The working group is also looking to present the tutorial at an upcoming PSRC meeting.

Since it would be apropos to have the application guide available at each of the conferences, the WG is asking the PSRC officers to use their clout to obtain a number of C37.99 guides at a reduced price to sell at each conference.

The WG plans to meet in a single session and requests a computer projector.

**K7: GUIDE FOR THE PROTECTION OF SHUNT REACTORS**

**Chair: K. A. Stephan**

**Vice Chair: P. G. Mysore**

The Working Group met in one session with 4 members and 1 guest.

Draft 3 which included revised drawings, re-writes, and an addition of a summary table was reviewed. Major topics of discussion included clarifying system effects as a result of faults on ungrounded wye-connected reactors, open-circuiting auxiliary power windings, and the new summary of shunt reactor relay protections.

Additional writing assignments were made for further clarifying system considerations for a fault on an ungrounded-wye connected reactor bank connected to the delta tertiary of a power transformer and further developing the summary of reactor relay protections.

The WG requests the one session for 20 people and does not require any A/V equipment.

**K8: GUIDE FOR PROTECTIVE RELAYING OF UTILITY CONSUMER INTERFACE**

**Chair: Irwin Hasenwinkle**

**Vice Chair: Fred Griffin**

The WG did not meet. Minor editorial changes have now been incorporated into the document. It will be submitted to the IEEE as soon as a change in a negative ballot has been reconfirmed with the the balloter. This working group may be able to disband at the next meeting.

**K10: SCC21 DISTRIBUTED RESOURCES STANDARD COORDINATION**

**Chair: William Feero**

**Vice Chair: Doug Dawson**

The working group met with 6 members and 8 guests. Doug Dawson chaired the meeting since Bill Feero was unable to attend.

The chair reported on the results of balloting on SCC21's P1547 Distributed Resources Interconnection Standard and proposed that K10 draft a proposal for wording changes that might help to reconcile some of the negative ballots concerning DR interconnection to secondary and spot networks. The ballot received 65% approval.

After discussion, the following addition was agreed upon as a recommendation to SCC21: Proposed addition to P1547 sub-clause 4.1.4: «Modifications to network protection made to accommodate DR shall not unduly compromise the protection of the network transformer.

The chair will see that this recommendation is passed to the P1547 working group.

Doug Dawson also indicated that the minutes title for the working group is correct and not the agenda. He also felt that the document will probably be recirculated in the fall. It is hoped to have P1547 out by the end of the year.

The working group will meet in a single session for 20 people. No A/V equipment is being requested.

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

**Chair: A. F. Elnewehi**

**Vice Chair: F. P. Plumptre**

The WG met in two sessions with 9 members and 4 guests attending.

The working group discussed two sections of draft 2 and several revisions were recommended. It was agreed that revisions to existing contributions as well as new writing assignments will be completed for further review before the September 2001 meeting. The guide should be completed by 2003.

The Chair asked about when the working group to apply for an extension to the PAR. It was felt by the subcommittee that the PAR should be easy to extend if the document is being set up to be balloted. Charlie Henville suggested making sure the document is ready for balloting 6 months before the PAR dies.

The WG requests two sessions for 15 people and does not require any A/V Equipment.

**Task Force Reports**

**KTF2: BREAKER FAILURE PROTECTION TASK FORCE**

**Chair: R.A. Hedding**

**Vice Chair:**

KTF2, the task force on breaker failure protection met Tuesday morning with 26 people attending. Of those attending, 16 indicated they would like to join a working group on this subject.

After introductions, a discussion of the need for such a working group was held. Realizing that there have been no documents published by the PSRC on this subject for possibly 20 years, other than a section in the «Trip Circuit Design» report, it was the consensus of the task force that a working group be formed to investigate breaker failure protection and to write a guide on the subject. The proposed assignment is:

To investigate breaker failure issues, and prepare a guide covering the application of breaker failure protection to power circuit breakers.

It is estimated to take three years to accomplish this assignment.

A PAR is being requested. Charlie Henville asked if there were 2 separate issues; investigation and then a guide. He suggested the assignment be to prepare a guide. Simon Chano said it may take about 8 weeks to get a PAR approval. The task force will meet in September. Members of the SC voted to approve the creation of a new PAR.

The task force requests a single session for 30 people. They request A/V equipment.

**KTF3: SCHEMES AND MEASURES THAT CAN BE ADOPTED TO PREVENT AND/OR REDUCE OUTAGE DURATIONS FOR SUBSTATION FAULTS TASK FORCE**

**Chair: B. A. Pickett**

**Vice Chair:**

The task force will work towards creating a paper that will discuss various methods that have been tried, adopted, rejected by various utility companies to reduce events that cause outages inside of a substation, and subsequently, how the outage effects the customer. The paper will probably be broken into two parts: 1. What can be done to prevent the incident from occurring, 2. Once an incident has occurred, what can be done to reduce the outage time. The task force will report to the subcommittee on whether a new working group should be created.

#### Liaison Reports

**Transformer Committee**, J.D. Huddleston III

The Transformers Committee met in Amsterdam, The Netherlands, in April, 2001. The Minutes of neither the Amsterdam nor the Niagara Falls meeting in October, 2000, are available at this time, but those for the April, 2000 meeting in Nashville are on hand. Since last reported in January, 2001, the following documents were balloted:

- C57.12.59-Rev. «Guide for Dry-Type Transformer Through-Fault Current Duration» – submitted as an e-ballot in March, 2001.
- C57.135/D12 *Recirculation* «IEEE Guide for Application, Specification, and Testing of Phase-Shifting Transformers» – March 9, 2001.
- C57.16-1996 *Reaffirmation* – «IEEE Standard Requirements, Terminology, and Test Code for Dry-Type Air-Core, Series-Connected Reactors»  
- April 6, 2001.
- C57.123/D1.7 «Guide for Transformer Loss Measurement»-Apr. 11, 2001.
- C57.19.100-1995 *Reaffirmation-Recirculation-* IEEE Guide for Application of Power Apparatus Bushings» – April 19, 2001.

#### Coordination Reports

**ANSI/IEEE Switchgear Standards-** F. Plumptre

**C37.20.3 Standard for Metal-Enclosed Interrupter Switchgear**

-Nothing to report

**C37.100.1, Common Requirements for IEEE Power Switchgear Standards**

-Nothing to report

**Transformer Committee-** J.E. Stephens

**Project C57.119, Recommended Practice for Performing Temperature Tests on Oil Immersed Power Transformers at Loads Beyond Nameplate Rating**

Nothing to report

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

Nothing to report

**C37.66 Requirements for Capacitor Switches for Ac Systems**, S R Chano

Nothing is reported.

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

Nothing is reported

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

Nothing is reported

**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.

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

Nothing is reported.

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

Nothing is reported.

**ANSI/IEEE Switchgear Standards**, Vittal Rebbapragada

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

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

Nothing is reported

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

Hasenwinkle

As of May 18, 2001. According to the Chairman, Ned Simon, this working group has completed Draft 11 of the revision to the standard. They expect to release this draft for balloting by the Balloting Group within a week or two.

**Old Business**

Several guides are to be completed in 2001.

**New Business**

Bruce Pickett handed out a proposal for a new WG entitled «Schemes and Measures that can be adopted to prevent and/or reduce outage durations for substation faults». Output would be a paper. It would be in 2 parts: 1) what can be done to prevent the incident from occurring, 2) once an incident has occurred, what can be done to reduce the outage time. Preventive and reactive methods were listed. Doug Dawson wondered if this should be in the substations committee not the relay committee. Bruce indicated that the relay engineer is usually the one that gets involved, at least at his company. Charlie Henville indicated the relay connection could be automatic switches, counting the customer minutes, etc. Simon Chano asked if the subject has interest in having a task force for this task force. The subcommittee decided that a task force be established. Bruce Pickett will be the TF chair (KTF3).

Tarlochan Sidhu suggested a TF on substation automation be created. He suggested the TF would ID the opportunities inside the substation where automation would improve the protection. Charlie Sufana asked about the relationship to H4, H5, and H6. The reply was what features can be looked at that could help relaying. John Tengdin explained that H5 is working on peer to peer communication and that a tech report is being printed. Doug Dawson wondered if the Bruce Pickett TF may be linked to the one from Tarlochan Sidhu. Tarlochan Sidhu agreed to review the H5 report and see what it has. The issue will be brought up again in September.

Carlos Castro asked about the inrush issue that appeared in the minutes from the January meeting. Simon indicated that it will be reviewed in the future.

Irwin Hasenwinkle asked about STATcon protection. Ahmed Elneweihi said that the subject may need to be addressed. Simon Chano thinks that the T&D committee may have something going because they are doing the watt/var control. Simon Chano said that there was a paper from the PSRC on static var compensators. He wondered if there is a need for a new working group on static var compensators but he didn't know if there was any interest yet. Charlie Henville told about a new DC system and the manufacturer is offering the protection; he said he has no clue of what is inside. Demetrios Tziouvaras wondered how the normal line protection would be impacted. Simon asked if there were any experts on the subcommittee. The issue will be proposed at the PSRC Main meeting. Charlie Sufana said that GE had in the past presented a one day crash course; so they should be contacted. Demetrios Tziouvaras is chairing a CIGRE WG and will look on how the distance protection would be impacted because of these devices. He suggested using EMTP to see how the relays would be impacted. There are numerous designs. John Burger indicated AEP has put in a Siemens UPFC; the protection engineer will need to get involved, some of it may be trial and error. He thought it would be a good idea to have something developed. There is a need to know how the device interfaces with the power system protection. The subcommittee may need to contact the vendors for a presentation on the topic.

Attachment

May 2001 PSRC Meeting Attendance

|       |                   |
|-------|-------------------|
| M.G.  | <b>Adamiak</b>    |
| A.P.  | <b>Apostolov</b>  |
| R.    | Bailey            |
| M.    | Basler            |
| P.G.  | Beaumont          |
| R.    | Beazer            |
| T.R.  | Beckwith          |
| B.L.  | <b>Beckwith</b>   |
| R.W.  | <b>Beckwith</b>   |
| M.M.  | <b>Begovic</b>    |
| K.    | <b>Behrendt</b>   |
|       | Beresh            |
| K.A.  | Birt              |
| O.    | Bolado            |
| B.    | Brobak            |
| G.A.  | Brunello          |
| J.F.  | <b>Burger</b>     |
| J.    | <b>Burnworth</b>  |
| W.M.  | <b>Carpenter</b>  |
| P.    | Carroll           |
| C.H.  | <b>Castro</b>     |
| T.W.  | Cease             |
| S.R.  | <b>Chano</b>      |
| AKS   | Chaudhary         |
| G.    | Chirco            |
| F.    | Cobelo            |
| J.R.  | Cornelison        |
| T.L.  | Crawley           |
| M.J.  | Danna             |
| A.N.  | <b>Darlington</b> |
| R.    | Das               |
| D.C.  | <b>Dawson</b>     |
| J.    | De La Ree         |
| M.E.  | Decesaris         |
| R.W.  | <b>Dempsey</b>    |
| M.    | Desjardine        |
| J.    | Di Stefano        |
| S.    | Dickson           |
| T.    | Domin             |
| C. L. | <b>Downs</b>      |
| W. A. | <b>Elmore</b>     |

|       |                    |
|-------|--------------------|
| A.    | <b>Elnewihi</b>    |
| D.    | Emigh              |
| K.M.  | Engelhardt         |
| G.E.  | Ferraro            |
| C.    | Fink               |
| K.    | <b>Fodero</b>      |
| J.A.  | Garcia             |
| J.D.  | <b>Gardell</b>     |
| J.G.  | <b>Gilbert</b>     |
| A.T.  | <b>Giuliante</b>   |
| G.J.  | Gresko             |
| D.    | Hamai              |
| R.    | Hamilton           |
| W.D.  | Harlow             |
| W.G.  | <b>Hartmann</b>    |
| I.O.  | <b>Hasenwinkle</b> |
| R. A. | <b>Hedding</b>     |
| C.F.  | <b>Henville</b>    |
| W.R.  | Heuser             |
| J     | Holbach            |
| R.    | Hunt               |
| C.R.  | Huntley            |
| J.W.  | <b>Ingleson</b>    |
| B.    | Jackson            |
| R.V.  | Jackson            |
| H.    | Jacobi             |
| G.F.  | Johnson            |
| R.D.  | Johnson            |
| R.T.  | Jonker             |
| D.    | Karlsson           |
| B.    | Kasztenny          |
| A.R.  | Kazemi             |
| B.    | Kennedy            |
| J.B.  | Kern               |
| P.    | Kerrigan           |
| M.    | <b>Kezunovic</b>   |
| C.    | Kinne              |
| G.L.  | Kobet              |
| E.    | Krizauskas         |
| B.    | Kruimer            |
| P.    | Kumar              |

|       |                  |
|-------|------------------|
| K.    | Kuras            |
| J.    | Kwan             |
| T.C.  | Lanigan          |
| S.    | Lindahl          |
| V.    | Madani           |
| P.G.  | <b>McLaren</b>   |
| H.I.  | Mehta            |
| M.    | <b>Meisinger</b> |
| D.H.  | Miller           |
| G.P.  | <b>Moskos</b>    |
| C.J.  | <b>Mozina</b>    |
| B.    | Mugalian         |
| J.    | Murphy           |
| K.K.  | <b>Mustaphi</b>  |
| M.    | Nagpal           |
| G.R.  | <b>Nail</b>      |
| A.P.  | Napikoski        |
| K.    | Narendra         |
| M.    | Nemier           |
| H.    | Ng               |
| D.    | Nordell          |
| D.J.  | <b>Novosel</b>   |
| J.M.  | Obrian           |
| R.W.  | Patterson        |
| A.G.  | <b>Phadke</b>    |
| T.A.  | <b>Phillippe</b> |
| B.A.  | Pickett          |
| F.P.  | <b>Plumptre</b>  |
| E.    | Price            |
| R. E. | <b>Ray</b>       |
| D.    | Reckerd          |
| M.    | Reichard         |
| M.S.  | <b>Sachdev</b>   |
| M.M.  | Saha             |
| C.    | Samitier         |
| M. P. | <b>Sanders</b>   |
| T.    | Seegers          |
| D.R.  | Sevcik           |
| T.    | <b>Sidhu</b>     |
| M.S.  | <b>Simon</b>     |
| K.A.  | <b>Stephan</b>   |

|      |                   |
|------|-------------------|
| W.M. | <b>Strang</b>     |
| C.R. | <b>Sufana</b>     |
| M.   | <b>Swanson</b>    |
| R.P. | <b>Taylor</b>     |
| M.   | Taylor            |
| J.T. | <b>Tengdin</b>    |
| J.S. | <b>Thorp</b>      |
| M.   | Toupin            |
| D.A. | <b>Tziouvaras</b> |
| J.T. | <b>Uchiyama</b>   |
| E.A. | <b>Udren</b>      |
| S.M. | Usman             |
| D.   | Uy                |
| B.A. | Vandiver          |
| S.   | Ward              |
| J.D. | Wardlow           |
| D.K. | Ware              |
| C.L. | Waters            |
| W.P. | <b>Waudby</b>     |
| D.   | Weers             |
| S.   | Weiss             |
| C.G. | Wester            |
| R.M. | <b>Westfall</b>   |
| J.   | Whatley           |
| R.L. | Whittaker         |
| P.B. | <b>Winston</b>    |
| M.   | <b>Yalla</b>      |
| L.   | Yang              |
| R.   | Young             |
| S.E. | <b>Zocholl</b>    |