

**POWER SYSTEM RELAYING  
COMMITTEE**

**OF THE**

**IEEE POWER ENGINEERING SOCIETY**

**Draft**  
**MINUTES OF THE MEETING**  
**Subcommittee Reports Only**

**January 8-11, 2001**

**Austin, TX**

## **C: System Protection Subcommittee**

**Chair: J. S. Thorp**

**Vice Chair: D. Novosel**

The System Protection Subcommittee met on January 10, 2000 at 2:30 PM in Austin, TX. 20 people attended the meeting, including 11 members.

The SC web-page will be handled by the SC chair. All information related to the System Protection SC will be put on the SC web-page by the SC chair.

Based on the results from the TF3 meeting, WG C5 - Deployment and use of Disturbance Recorders - is approved, with Barry Jackson as a chairman and Bill Strang as a vice-chairman.

Barry Jackson was added to the Subcommittee

### **WG Reports:**

#### **C1: Software Models for Relays**

**Chair: P. G. McLaren**

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

**Established: 1995**

**Expected Completion Date: 1999**

**Output: IEEE Transactions Paper**

The WG did not meet.

#### **C2: Power Quality Issues in Protective Relaying**

**Chair: T.W. Cease**

**Vice Chair: David Hart**

**Established: 2000**

**Expected Completion Date: 2003**

**Output: Report to Main Committee and IEEE Transactions Paper**

C2 met Wednesday January 10, 2001 in Austin, TX with 12 members and 27 guest present. During the meeting 6 of the guest became members and accepted writing assignments. There are now 26 members of this working group. It may be necessary to seek a reduction in the number of members.

A presentation on IEEE 519 Standard was made by Russ Patterson. A presentation on ITIC Standard was made by Gary Kobet. Agreement was reached on the report format by all present. Writing assignments were made with a due date of the end of April.

#### **C3: New Technology for Transmission and Distribution Protection**

**Chair: A. P. Apostolov**

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

**Established: 1994**

**Expected Completion Date: Continuing**

**Output: Report to Main Committee and IEEE Transactions Paper**

WG C3 New Technology for Transmission and Distribution Protection met for a single session on 1/10/2001 with 12 members and 37 guests present.

Two topics were discussed by the working group:

- Anatomy of COMTRADE (Benton Vandiver, OMICRON Electronics)

The discussions were related to the COMTRADE files format and how properties of the configuration file can affect the output, as well as what to look for when analyzing such files.

- Communications Terminology (Alex Apostolov, ALSTOM)

The discussion was related to the terminology related to communication in Local and Wide Area Networks, network configurations and their evolution. The second part of the presentation addressed Object Modeling and its application to protective multifunctional IEDs.

The working group will meet in Vancouver in a single session. The agenda for the meeting in May 2001 will be provided on the working group web site by April 15.

**C6: Wide Area Protection and Emergency Control**

**Chair: M. Begovic**

**Vice Chair: D. Novosel**

**Established: 1996**

**Expected Completion Date: 2000**

**Output: Report to Main Committee**

The working group met on January 9, 2001 in a single session with 9 members and 11 guests in attendance. Charlie Henville reported about the upcoming related activities planned for the IEEE PES Winter Meeting. Miroslav Begovic informed about some of the opportunities to organize sessions at the conferences in 2001. Damir Novosel informed about the session organized at the IEEE SCI'2000 conference in June 2000, where 6 members of the WG contributed papers. Current draft of the report (version 5.0) was discussed. Most of the material intended to be in the report is included, and at this point, minor additions are necessary, followed by extensive editing work. Appropriate assignments were made to assure that we have a complete final draft by May meeting. There was some discussion about the publication of the report: it could be made available to the general public via a web site from which it could be downloaded without any restrictions, or published as a special publication through IEEE. In either case, the group will prepare a condensed version of the report in the form of a transactions paper. The final decision about publication should be made at the May meeting, and both report and the transactions paper should be completed by September meeting.

**C7: EMTP Applications to Power System Protection**

**Chair: D. Tziouvaras**

**Vice Chair: L. Kojovic**

**Established, 1997**

**Expected Completion Date: 1999**

**Output: Report to Main Committee**

This WG will give a tutorial at the IEEE Winter meeting in Columbus, Ohio.

**C8: Phasor-Based Models for Analyzing Relay Performance**

**Chair: Mike Meisinger**

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

**Established, 1997**

**Expected Completion Date: 2002**

**Output: Transactions Paper**

The Working Group met at 9:30 AM on January 09, 2001 in Cypress Room, Austin North Hilton Hotel & Towers, Austin, TX. Seven members and thirteen guests were present.

Drafts of three sections reassigned at the May 2000 meeting had not been received. Jaime De La Ree, who was present at the meeting, promised to provide his draft well in advance of the next meeting. Mike also promised to have his assignment completed by the next meeting.

Gabriel Benmouyal is to provide an appropriate definition of the scope of applications in which relay engineers can use phasor-based models. He is also to provide an example of CVT for inclusion in the paper.

Juergen Holbach joined the Working Group.

**C9: Underfrequency Load Shedding and Restoration**

**Chair: A. Apostolov**

**Vice-Chair: K. Behrendt**

**Established, 1999**

**Expected Completion Date: December 2001**

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

The working group met on Tuesday, January 9th, with 18 members and 9 guests present. The working group reviewed the guide's scope, purpose, and outline that were developed at previous meetings. Some 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.

Revisions to existing writing assignments should be made as necessary, with new text in red, and deleted text in strikethrough and emailed to the working group chairman (Alex). Changes and new writing assignments should be emailed to the working group chairman by the end of March. These changes and contributions will be compiled and redistributed by the middle of April, so comments can be received before the May meeting.

A few volunteers will be sought to edit the document for consistency.

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 remains December, 2001. The working group expects to meet in single session at the next PSRC meeting, and needs a room for 40 with a projector screen.

**C10: Effects on Changing Utility Environment on Protective Relaying**

**Chair: J. DeLa Re**

**Vice-Chair: R. Hunt**

**Established, 1999**

**Expected Completion Date: 2002**

**Output: Report to Main Committee**

The working met 9:30 AM, Wednesday, January 10, 2001 in Hill Country B with 26 members and guests. The Chairman distributed copies of the last meeting minutes.

Mohamed Ibrahim of NYPA presented on changes in utility environment on NYPA, touching on topics including fragmentation of electric utilities, downsizing, change of ownership, operation close to limits, addition of merchant plants, difficulty in obtaining outages, and short supply of technically competent management. Mohamed started his presentation with the quote "De-regulation has brought hi-tech America the electricity grid of a third world country".

Charlie Henville presented the first draft of possible survey to be sent to protection engineers. Survey is segregated into generation, transmission, distribution protection, and other system protection effects.

#### Assignments and Action Items

- Ed Krizauskas to present WG I-11 survey results at next meeting.
- Chair to distribute copies of first draft of survey. Members to comment on survey questions by March 15, 2001.

### **C11: Protection Issues during System Restoration**

**Chair: T. Sidhu**

**Vice-Chair: D. Tziouvaras**

**Established: 2000**

**Expected Completion Date: 2003**

**Output: PSRC Report**

The working group met with 8 members and 15 guests in attendance. Mohamed Ibrahim and Nash Kassam made presentations of their experiences with protection systems during system restoration. A number of protection related issues were identified that will form a part of the report. Mohamed and Nash agreed to provide write-ups identifying and explaining these issues. Demetrios Tziouvaras and Simon Chano who made similar presentations in earlier meetings also agreed to provide write-ups on the protection issues discussed by them. In addition, Brad Nelson and Kalyan Mustaphi agreed to provide write-ups on the subjects of reclosing during restoration and black start respectively. These write-ups are due to the Chairman by end of March 2001. The WG members also agreed to structure the report based on protection issues rather than relay types. The Chairman will circulate a preliminary outline of the report and the above-mentioned write-ups to all WG members for discussions at the May meeting. Kalyan Mustaphi agreed to make a presentation at the May meeting on the topic of protection issues during black starting of units.

### **TF3 : Deployment and use of Disturbance Recorders**

Task Force TF3 was created to determine PSRC interest in the topic loosely described as "Deployment and use of Disturbance Recorders including IEDs, DFRs, SOE, and DDRs. There were 31 interested people in attendance at the meeting.

Meeting discussions on possible assignment for a working group included producing:

1. An exhaustive summary paper listing and describing good application papers.
2. A document describing how to find compliance statements of various NERC councils.
3. A descriptive paper discussing deployment and use of recorders
4. Software to automate event analysis

5. An update on recent related topics including microprocessor relays oscillograph recording, smart meters, use of internet for disturbance information, synchrophasors, UCA, GPS, Etc.

There was also lengthy discussion on developing a document containing reasons, arguments to help justify more disturbance recorder installations.

Finally, the following assignment is proposed for a new working group "Develop a report to the main committee on the Deployment and use of Disturbance Recorders for Protection". The report will initially cover:

- Types of monitoring equipment
- Placement of equipment
- Frequency sampling rates
- Examples of effective use
- Reference to papers

A detailed outline will be developed if the proposed working group is approved.

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

Phase III compliance is underway. Protection related standrads involve: Disturbance monitoring, Gnerator tripping, and Undervoltage load shedding schemes. Compliance seminars are scheduled and the schedule for compliance fillings have been communicated to all regions.

### **Liaison Report of the IEEE PES Power System Stability Controls Subcommittee (SC) to the PSRC** **Gary Michael**

Liaison Report of the IEEE Working Group on Power System Dynamic Measurements Meeting at the IEEE/PES Summer Power Meeting in Seattle, WA on July 17, 2000

By invitation, a presentation was given by Mr.Alex Bykhovsky. He is developing software to look at the disturbances and analyze the events. A copy of the presentation was distributed to the group and some plots were shown on the computer.

By invitation, a presentation was given by Dr.John Hauer of the PNNL on the WSCC Measurement Compliance of the NERC requirements. A draft prepared by the WSCC was also distributed by Mr.John Hauer to the Working Group.

After discussion of the title, the WG decided to write a paper "Preferred Capabilities for Power System Dynamics Measurements". The chair was tasked to find a title that would avoid having to meet standards requirements. The chair was tasked to contact vendors to seek individuals for the Task Force. He asked the Working Group to suggest vendor names and information. Several technical issues were discussed as appropriate for the WG paper, including measurements necessary to determine: How close to the edge; response of the system loads; Initiating events; Data rates; Quantities; Sources of data; Uses of measurements [goals of measurements]; Others. Martin, Bhargava, and Schulz agreed to put together an outline and send it out to the Task Force.

### **D LINE PROTECTION SUBCOMMITTEE**

R.M. Westfall, Chairman

Mark Carpenter, Vice Chairman

The Line Protection Subcommittee met in Austin, Texas on January 10, 2001 with 24 members and 28 guests present and Chairman Ron Westfall presiding. The minutes of the Andover, Massachusetts meeting were approved.

**D1: EFFECTIVENESS OF DISTRIBUTION PROTECTION**

**P. Carroll, Chairman**

**C. Fink, Vice Chairman**

**Established: 1994, Output: IEEE Paper**

**Expected Completion Date: 2001**

**Status: Draft #5**

The working group met with 8 members and 17 guests. After introductions and approval of the September meeting minutes, the WG discussed survey status and future plans. Since our last meeting, disk copies of the survey were mailed out to mailing list recipients without an e-mail address. To date, a total of 25 responses have been received out of 200 sent. Ed Krizauskas then shared information on his WG experience with the number of responses received and survey analysis issues. The group consensus was that a 50% return rate or about 100 responses would be the most that we could expect to achieve. It was agreed that it would be appropriate to send out a reminder to disk copy recipients who have not yet responded. Also, Ed will begin compiling our existing responses for review and discussion at our next meeting. The meeting concluded with a presentation by Karl Zimmerman entitled, "International Drive Distribution Automation and Protection". In his presentation, Karl gave an overview of the relay protection issues and features associated with a project designed to increase the distribution system reliability in a resort area south of Orlando, FL. Thanks to Karl for his presentation.

**D2: FAULT LOCATING**

**Karl Zimmerman, Chairman**

**Damir Novosel, Vice Chairman**

**Established: 1996, Output: IEEE Guide**

**Expected Completion Date: 2002**

**Status: Draft #5**

Working Group D2, Fault Locating, met on Wednesday, January 10, 2001 with 10 members and 10 guests present. An official PAR extension form will be submitted by March 1, 2001.

Draft 5 has been created, but not sent to the Standards Board to create an invitation to ballot, pending the resolution of an issue with a WG member. Moh Sachdev's agreement to re-write the Introduction Section to the guide by March 1, 2001 has resolved this issue. An unofficial ballot will be e-mailed to all WG and SC members by January 15, 2001. Any negative ballot issues must be received by March 1, 2001. If none are received, we shall send the final draft to the Standards Board.

**D4: AUTOMATIC RECLOSING**  
**W.M. Strang, Chairman**  
**Mal Swanson, Vice Chairman**  
**Established: 1996, Output: IEEE Guide**  
**Expected Completion Date: 2001**  
**Status: Current Draft #7**

The working group met on January 9, 2001 with 16 members and 13 guests.

Draft 7.1 was circulated for ballot and the ballot closed on Friday, January 5, 2001. Several respondents forwarded their ballot comments to Bill Strang as well as with their ballot responses to IEEE. These received and tabulated comments were discussed in terms of their organization in the tabulation only. The remaining comments (which have not been received at this time) submitted with ballot responses are expected to be received by Bill Strang and will be forwarded to the review group within 2 weeks.

Jim Huddleston, John Boyle, Paul Drum, Tony Seegers, Ed Krizauskas, Mike McDonald, Bill Strang, and Al Darlington are the editorial review group and will review the comments received from the ballot.

A number of comments were received from the balloting body via e-mail. These have been tabulated and this tabulation will be expanded after Bill Strang receives the full balloting comments from IEEE. This tabulation will be transmitted to the editorial review group for review and recommendation. A revision to the guide and the tabulation of changes will be circulated to the working group prior to the next meeting.

A comment regarding the organization of the document relative to the clause on Fundamentals and its content including the sub-clause on definitions was received from the IEEE editor and discussed. Charles Sufana agreed to re-arrange this clause, breaking out the definitions and inserting the remaining material into a new clause 4. This means renumbering all subsequent clauses and the internal clause references. This task will be accomplished after all other editorial and substantive changes are incorporated.

**D6: TRANSMISSION LINE PROTECTIVE SYSTEMS LOADABILITY**  
**Tony Seegers, Chairman**  
**Ed Krizauskas, Vice Chairman**  
**Established: 1997, Output: Special PSRC Publication**  
**Expected Completion Date: 2001**  
**Status: Draft #8**

The working group met on Tuesday, January 9, 2001 with 13 members and 13 guests in attendance.

Draft 8 was distributed. The working group and the subcommittee were requested to survey ballot the paper. 15 responses were received with 1 negative response, which has been resolved.



The paper has been accepted for the Georgia Tech Conference. It doesn't appear that we are on the Texas A&M agenda at this time. We plan on submitting to the following:

- Texas A&M
- Western Protective
- MIPSYCOM
- ECNE
- PEA

The group is looking for a presenter for Georgia Tech. Based on further resolution of comments, Draft 9 will be produced and re-circulated. Assuming a favorable re-circulation, the group would like to pass the paper on to the PSRC officers for final review. Publication will be ACROBAT format on the Web.

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

**Mustaphi, Chairman**

**T.Sidhu, Vice Chairman**

**Established: 1998, Output: Transaction Paper**

**Expected Completion Date: 2002**

**Status: Draft #1**

**The working group met in double session on January 9, 2001 with 8 members and 9 guests in attendance. The members reviewed four write-ups and necessary changes were discussed and agreed upon. The members took up assignments and revised write-ups will be sent to the chairman by February 28, 2001. The chairman will organize Draft #1, which will be sent to the members by April 15, 2001.**

**Old Business:**

None

**New Business:**

A new task force was formed. DTF1 will prepare a PAR for the preparation of a Distribution Line Protection Guide. John Zipp will be the chairman for this task force.

A new WG was also established. Working Group D3 will prepare a paper exploring the impact of distributed resources on distribution line protection. Tony Seegers will be the chairman for this working group. If warranted, this may become part of the distribution protection guide.

Volunteers for both activities are welcome.

**General Discussion:**

None

**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**

**Established: 1995**

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

**Expected Completion Date: 1999**

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

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

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

**Chair: D. Holstein**

**Vice Chair: Eric Udren**

**Established: 1997**

**Output: Standard**

**Expected Completion Date: 1999**

H4's working group report to the H subcommittee meeting in Austin, TX is provided. Dennis Holstein (Chairman) and John Tengdin (Vice-Chairman) attended. John Tengdin was the secretary for this meeting.

H4 met in double session. Twenty-two members and guests attended.

The minutes and agenda were reviewed and accepted.

H4 objective is to release C37.115 for electronic ballot by the end of 2001. This is more than 4 years after the PAR was approved. A new detailed project plan was developed; H4 reviewed the plan, and a draft of the PAR extension. Agreement was reached, and the chairman will submit in February 2001, a request to extend the PAR completion date 2 years. A copy of the request will go to the PSRC Standards Coordinator.

Draft 4 was placed on the FTP site for review in December 2000. H4 members and guests provided comments and recommendations at the meeting. Additional comments and recommendations will be sent by EMAIL to the H4 Chairman. These contributions will be reviewed, and as appropriate, integrated into Draft 5. Then, in mid-April 2001, Draft 5 will be released to H4 members for review and comment. Comments will be discussed at H4's meeting in Vancouver, Canada.

H4 requests a room for 20 members and guests. H4 will meet in single session, and a computer projector is needed for their meeting in Vancouver, Canada.

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

**Chair: M. Yalla**

**Vice Chair: M. Adamiak**

**Output: Paper**

**Expected Completion Date: 2001**

The WG met on Wednesday Morning with 8 members and 10 guests. The H5 report to subcommittee was posted on the PSRC website. Subsequent to this posting some additional comments were received by the chairman from John Tengdin and Doug Dawson. These comments were discussed at the WG meeting and they will be incorporated into the document and the PSRC website will be updated with the revised document. The WG formed a four-member team to come up with a draft for the IEEE Transaction paper based on the H5 report. The WG plans to complete the new assignment by 2002.

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

**Chairman: John Burger**

**Vice Chairman: Charlie Sufana**

**Output: Special Report**

**Established: 1999**

**Expected Completion Date: 2003**

1. Intro by John Burger. John reviewed the title of the paper and gave a brief overview of the proposed paper.
2. Minutes of the Andover meeting were reviewed and a recommendation was made by Dennis Holstein to only provide one set of minutes with appropriate title. With a minor correction on line 8(ACSE to ACSE) the minutes were approved.
3. Kay Clinard gave an update on the status of IEC 61850. Parts of 61850, Section 3&4 , have been accepted as a draft international standard. Tissues are still being addressed by the UCA group. Work on 61850 has opened some issues concerning the implementation of GOOSE and some naming conventions in GOOSE.
4. Mark Adamiak provided a presentation on the enhancements proposed to UCA due to work with 61850. Changes proposed in GOOSE were discussed. Currently there is a European version and a US version. Europe is proposing removing the DNA bits from GOOSE. Europe is also proposing expanding GOMSFE to allow the substitution of variables, qualifier, etc.
5. John Tengdin provided a presentation on 'High Accurate Time Synchronization over Switched Ethernet' based on a paper of that title by Tor Skeie of ABB Norway and others. The paper noted the requirements from 61850 are 1microsecs for class 1 and 25microsecs for class 2. The authors notes that they can achieve class 1 using a time server from Lantronix, an On Time Networks fast Ethernet switch and SNTP.
6. A short discussion ensued on developing an outline for the paper from the bulleted items provided in the agenda. This led to a discussion on who is the target audience and what form the paper should be provided in, etc.
7. .Volunteers were requested to provide input for the paper. Herb Falk volunteered to provide a write up on MMS programming. George Chirco also volunteered to provide information on the network hardware i.e. switches, hubs, etc for the paper. We also

discussed the existing assignment of Mark Simon to provide a write up on GOOSE and the form that write up should be.

8. Writing assignments were received from Clarence Wallace and Jerry Haun. They will be reviewed at the next meeting in Vancouver.
9. We had 11 members and 21 guests attend the meeting

Submitted by John Burger on 1/10/01

## **H7: INTER RELAY COMMUNICATION PROTOCOL STANDARD**

**Chair: G. Michel**

**Vice Chair:**

**Established: 1997**

**Expected Completion Date:**

IEEE PSRC H7 WG Minutes for Austin (01/01):

Thirteen members and guests met in two sessions. Comments from the Draft 6 document were reviewed. A revised document resulted that will be sent to WG members for their review. This document will also be sent to the PES PSCC

for their review at the upcoming PES WPM in Columbus, OH.

The IEEE-SA approved the H7 PAR revision to change the proposed standard from trail use to full use.

A proposed H7 presentation was handed out to attendees.

1/9/01 Attendees: Miriam Sanders, Chris Huntley, Mark Simon, Veselin Skendzic, Ken Behrendt, Solveig Ward, Ken Fodero, David Van der Merwe, Bill Higinbotham, Tim Phillippe, Mark Adamiak.

1/10/01 Attendees: Ken Behrendt, Ken Fodero, Chris Huntley, Tim Phillippe, Ken Martin, Gary Michel.

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

**Chair: Jim Ingleson**

**Vice Chair: Mark Taylor**

**Established: May, 1999**

**Output: Report to the PSRC**

**Expected Completion Date: January, 2001**

January 9, 2001, Austin, TX

Summary: Major changes were made to the filename to stay under a 65 character limit for storage on (CDs) compact discs.

An attendance list was circulated and each of those present introduced themselves. The following members and guests were present:

Members:     Jim Ingleson, Chair  
                  Mark Taylor, Vice-Chair  
                  Mike Xavier  
                  Ken Martin  
                  Tony Napikoski  
                  Larry Johnson  
                  Jack Chadwick  
                  Mark Adamiak

Guests: Michel Toupin toupin.michel@ireq.ca  
Herb Jacoby hjacobi@bpa.gov  
Kay Clinard kayclinard@cs.com

Copies of the Working Group Report, Rev. 2.3, were distributed.

There were no comments on the minutes or the last meeting, or this agenda. The Chairman read an e-mail from Amir Makki.

There is no progress reported on any of the assignments made at the last meeting, however the assignments on file extensions and event code are no longer necessary after some changes agreed to at this meeting:

File Extensions	Amir Makki
Event Code	Mark Taylor
Glossary	Tony Giuliante

Both Mark Taylor and Jim Ingleson has run into a limitation on the length of filenames written to CDs. The limit to length of filenames on CDs is 64 total characters, 65 if you include the dot. Mike Xavier has researched the origin of the limitation and will report this to the Chairman. After discussion the group conclude that the CD format may be around for many years, and we must make it clear how users can make choices that will allow them to stay under this limitation. This led to a number of changes in the filename:

The date will begin with a 2 digit year comma. The comma after year was eliminated. This saves three characters.

Everything after the company name is optional, free form. Users may add fields for any purpose they wish, including:

- Duration
- Type of event code
- Geographic Position
- Comment

It will be required that a file extension be added which indicates the type of file. The Comtrade extensions will be reserved. All other extensions are available.

The Chairman will ballot the working group members. This is an unofficial ballot but seems to be a good step to take before the report is presented.

A presentation of the report is schedules for the FDA Conference at GA Tech on April 30 - May 1, 2001. The Chairman will explore the possibility of presenting the report to the PSRC in May or September.

The following is an accounting of how the revised filename will allow us to stay within the 65 character limitation:

Date	6	
Comma	1	
Time	9	(to millisec. This will vary.)
Comma	1	

Time Code	3	(Only 2 for Universal time, for fractional zones 5)
Comma	1	
Station 12		
Comma	1	
IED Name	12	
Comma	1	
Company	12	
Dot	1	
Extension	3	
Sum	63	

A company that is able to express their name is just a few characters then has more characters available for Station Names and IED Names.

Examples:

000809,175215183,-4d,newscotland,ben717,nyiso,t.cfg

000809,175215183,-4d,newscotland,ben717,nyiso,0000000959,t,n04261,w07390.dat

Respectfully submitted,  
James W. Ingleson, Chairman of H8  
h8minutes\_jan2001

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

**Chair: M. Sanders**

**Vice Chairman: M. McDonald**

**Established: 1999**

**Output: Practical Paper for presentation at regional conferences**

**Expected Completion Date: 2001**

H9 Working Group met in a single session on January 10 with 10 members and 5 guests. Draft 4 of the special paper was distributed. The draft was reviewed and several topics were assigned to be expanded as well as additional assignments for the existing topics. The writing assignments are due to the chair by April 2, 2001.

The chair will forward draft 4 electronically to the members. Two members were added to the working group as well as two resigned.

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

**Chairman: Bill Higinbotham**

**Vice Chairman: Jerry Hohn**

**Established: 1997**

**Output: Revised application guide**

**Expected Completion Date: 2000**

Minutes of Working Group H10

IEEE Guide for Power System Protective Relay Applications of Audio Tones over Voice Grade Channels PC37.93

The Working Group met on January 10, 2001 for a single session with 8 members and 3 guests present. A review of the writing assignments for draft 4 was performed. Additionally the figures were re-drawn and a review was started. The members were asked to continue to review the figures.

The Chairman wishes to have all submittals by March 1st. The draft will be forwarded to Working Group members for their review prior to the May meeting.

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

**Chairman: K. Martin**

**Established: 2000**

**Output: Revised Standard**

**Expected Completion Date:**

Working Group H11 met at 8:00 am on Wednesday, January 10. Ten members and one guest were present.

Ballots to re-affirm the 1995 IEEE Standard for Synchronphasors for Power Systems, IEEE Std 1344, have been returned. Approval is expected at the next Standards Board meeting.

The PAR for the revised Standard has been approved. The revised Standard will be named C37.118.

The Working Group will continue to pursue forming a companion IEC Synchronphasors Standard working group.

Suggestions for changes and enhancements for the revised Standard were discussed. The Working Group agreed to several formatting revisions in the configuration file, data file, and header file. The requirements for time synchronization were also discussed.

Each section in the existing Standard was briefly reviewed to identify possible changes and updates. Several members took on writing assignments to be incorporated in Draft 1.0.

Submitted by,  
Dan Hamai  
Vice Chairman

### **Task Force Reports**

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

**Chairman: E. Udren**

**Established: 1996**

**Expected Completion Date: 1998**

No meeting, no significant developments at IEC TC57 WG 12.

**HTF2: PROTECTION USING WIRELESS COMMUNICATIONS**

**Chairman: Ken Behrendt**

**Vice Chair: Bill Lowe**

**Established: 2001**

**Expected Completion Date:**

The task force met on Tuesday, January 9<sup>th</sup> with 29 attendees to discuss interest in a proposed working group on Protection Using Wireless Communication. After some discussion, the group reached a consensus that a document, such as a paper, report, or web publication, on Protection Using Spread Spectrum Communication, was sufficiently focused and valuable to be achievable and worthwhile. 15 attendees indicated an interest in being members of a working group.

Discussion about a working group name and assignment yielded the following proposal:

Title: *Application of Protective Relays Using Spread Spectrum Communication*

Scope:

*This project will develop a document for the application of protective relays using spread spectrum communication for power system protection schemes. It will present background information, bibliography, and recommendations. It discusses spread spectrum 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 communication..*

Purpose:

*There is currently no IEEE document describing the application of protective relays using spread spectrum communication. Protective relaying and spread spectrum 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 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.

The task force proposes that a working group be formed to prepare the proposed document, with a suggested completion date of May, 2003.



If approved, the working group would meet in single session at the next PSRC meeting. A room for 30, with a projector screen is needed.

Respectfully submitted

Ken Behrendt

Task Force Chairman

## ***Liaison Reports***

### **1. 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.

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

No meeting nothing to report.

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

#### **TC 57 - Teleprotection and Power System Control**

WG 10, 11, and 12 continue work on IEC 61850, Communication Networks and Systems in Substations, which defines a standard protocol for substation control and protection, including alternate communications stacks to be used with a standard substation-defined object-oriented user layer. This work is related to, but struggles to coordinate with, the UCA substation control work and the P1525 Standard work taking place in the PSRC.

Through many meetings during 2000, 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.

Scott Neumann replaces Jack Thorson as the Technical Advisor to the USNC of IEC for TC 57.

#### 4. SCC 36 - D. Holstein

##### Coordination Reports

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

The C93 committee last met in Newark, NJ in June 2000.

At this meeting we continued work on C93.4 "Line Tuners and Auxiliary Equipment." Auxiliary equipment in this case is hybrids and L/C filters. This will probably be the last meeting of the C93 committee as it now stands. The secretariat of C93 over the past 25 years has been NEMA. NEMA a few years back had decided that they were no longer willing to support the committee with dollars and had ask Westinghouse and GE to provide funds to support this committee work. At that time there was a treasury established which allowed NEMA to draw funds in order to support the efforts of the C93 Committee. This money has now run out and since none of the people now involved in C93 are members of NEMA, they do not feel that they want to contribute to NEMA to support this effort.

The suggestion has been made to move these efforts to the Power System Communications Committee of PES. This way we could all support this work through our normal IEEE meetings. The only thing the Standards Board of the IEEE requires is that NEMA write a letter to release the copyright of the four standards involved to IEEE. We are in the process of attempting to get the required letter from NEMA.

##### **Old Business:**

The ARRL's (Amateur Radio Relay League) request for proposal to the FCC is still pending.

##### **New Business:**

During the ADCOM meeting it was noted that members of the PSRC main committee have a responsibility to ballot on Standards/Guides that reflect the needs our industry. It was recognized that there are times when a member doesn't have the experience to fairly judge some Standards/Guides. There is no requirement that all members ballot all Standards/Guides. However, if a member accepts an invitation to ballot and fails to return the ballot it is not only grounds from being removed from the IEEE SA but from the Main committee.

It was noted at ADCOM that there are many PSRC participants that do not have Senior Membership status. Information on Senior Membership can be found on the IEEE web site. The PSRC officers offered to help applicants obtain

personal references if needed.

## **I: RELAYING PRACTICES SUBCOMMITTEE**

**Chair: Jeff Gilbert**

**Vice Chair: Larry Smith**

The Relaying Practices Subcommittee (SC) met on September 20, 2000, in Austin, TX. A total of 27 members and 26 guests attended. Minutes of the previous September 2000 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**

**Established: 1996**

**Output: Revision of IEEE C37.103-1990**

**Expected Completion Date: 2000**

The present Draft 11 incorporated all of the comments and changes from Draft 10; the task of this session was to carefully re-read the document and clear up any ambiguities and inconsistencies. This was done and Mr. Marsh will make a final revision and submit new Draft 12 to the Working Group and Subcommittee as a consensus ballot.

### **I2: TERMINOLOGY USAGE REVIEW**

**Chair: Mal Swanson**

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

**Established: 1986**

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

**Expected Completion Date: Continuing**

A list of the remaining unresolved definitions from Word List 4 were distributed. The remaining definitions were resolved and Figures 1-4 were clarified. Mr. Darlington will revise the Figures and send them to Mr. Huddleston for incorporation into Word List 4 for submission to the PSRC officers for approval to send to the Standards Board.

### **I3: RELAY PERFORMANCE MEASURING CRITERIA**

**Chair: W.M. Carpenter**

**Vice-Chair: F. Marquez**

**Established: 1996**

**Output: Special Publication**

**Expected Completion Date: 1999**

Completed.

### **I4: IEC STANDARDS ADVISORY**

**Chair: Eric Udren**

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

**Established: 1989**

**Output: IEC Standards**

**Expected Completion Date: Continuing**

The working group discussed topics in the IEC report. Special focus was given on comments for 60255-22-5 Surge Test Vote and 60225-22-6 Conducted immunity test.

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

**Chair: Eric Udren**  
**Vice-Chair: Peter McLaren**  
**Established: 1992**  
**Output: New Trial-Use IEEE Standard P1331**  
**Expected Completion Date: 1999**

The working group review a draft of the transactions paper to accompany the standard. The standard is in the IEEE balloting process.

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

**Chair: Mario Ranieri**  
**Vice-Chair: James Teague**  
**Established: 1993**  
**Output: Revision of ANSI/IEEE C37.90-1989 (R1994)**  
**Expected Completion Date: 1999**

Draft #11 and the last two remaining items needing resolution were discussed in detail A detailed review of the draft and remaining items resulted in finalizing all the open issues. The working group needs to complete the balloting process and final review of the comments before the end of August.

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

**Chair: J. Teague**  
**Vice-Chair: M. S. Simon**  
**Established: 1992**  
**Output: New IEEE Standard C37.90.3**  
**Expected Completion: 2001**

The Working Group reviewed and resolved 54 comments received from balloting. The comments, which were incorporated in the final draft, will be sent to the IEEE for either re-balloting or approval.

**I8: REVISION OF C37.90.1 - SURGE WITHSTAND CAPABILITY (SWC) TESTS FOR PROTECTIVE RELAYS AND RELAY SYSTEMS**

**Chair: J. G. Gilbert**  
**Vice-Chair: J. Teague**  
**Established: 1994**  
**Output: Revision of IEEE Standard C37.90.1-1989 (R1994)**  
**Expected Completion: 2001**

The working group discussed whether the RF coaxial outputs of power line carrier sets should be SWC tested and voted to refer to C37.95 and to exclude SWC testing of RF inputs and outputs. The Chairman will revise the draft and send the revised document to the working group for approval by March 1, 2001. Upon approval by the working group, the Chairman will arrange for re-ballot.

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

**Chair: Subinoy Mazumdar**  
**Vice-Chair: Sahib Usman**  
**Established: 1998 (originally WG J7)**  
**Output: Revision of C37.105**  
**Expected Completion Date: 2001**

Approval has been received for the PAR. Following discussion on changes to the needed to the current standard, assignments were made to begin writing.

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

**Chair: Mason Clark**

**Vice Chair. Munnu Bajpai**

**Established: 2000**

**Output: Revision of IEEE Standard C37.98**

**Expected Completion: 2004**

Discussions on the current draft were began. Obtaining a copy of IEEE 344 for co-ordination and review.

#### **I11: RELAY TEST PRACTICES SURVEY**

**Chair: Ed Krizauskas**

**Vice-Chair: Bill Lowe**

**Established: 1998**

**Output: Transactions Paper**

**Expected Completion Date: 2001**

74 responses to the survey have been received to date. The working group will continue to incorporate responses as they are received. A hard copy of the first draft of the report was distributed and discussed.

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

**Chair: Mike Meisinger**

**Vice-Chair: Don Sevcik**

**Established: 1998**

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

**Expected Completion Date: 2002**

Del Weers provided a write-up documenting his comments and suggestions to Harley Gilleland's draft outline, with substance material, for the proposed Optical Current Sensor Systems section of the revised guide, which was reviewed and discussed. Mr. Gilleland agreed to invite one or two manufacturers of optical current sensor systems to make a presentation at the next meeting pertaining to their recommendations regarding field testing.

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

**Chair: Moh Sachdev**

**Vice-Chair: Brian Mugalian**

**Established: 1998**

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

**Expected Completion Date: 2001**

Brian Mugalian reported that he had mailed the approved survey questionnaire in October and had received seventy-two responses. He provided a summary of the information contained in the responses. The contents of the survey were discussed and a few questions were raised. Brian was deputed to obtain additional information from the respondents of those questionnaires and report back to the Working Group at the next meeting.

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

**Chair: Tim Phillippe**

**Vice-Chair: Ray Young**

**Established: 1998**

**Output: Special Publication**

**Expected Completion Date: 2003**

The working group has decided to have presentations on different subjects pertaining to communications at each of the next few meetings. All members of the IEEE-PSRC are invited to attend these presentations at our meetings. The chairman is still looking for any lists of terms that people feel are within the scope of this working group.

**I15: REVISION OF C37.110 - GUIDE FOR THE APPLICATION OF CURRENT TRANSFORMERS**

**USED FOR PROTECTIVE RELAYING PURPOSES**

**Chair: G. P. Moskos**

**Vice-Chair: B. Jackson**

**Established: 1998**

**Output: Revision of IEEE C37.110-1996**

**Expected Completion Date: 2003**

A presentation of the "CT Saturation Calculator" program was given. A description of the program will be added to the Annex with a reference to the program being made available on the PSRC web site.

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

**Chair: M. Sachdev**

**Vice Chair: R. Das**

**Established: 2000**

**Output: Special Report**

**Expected Completion: 2003**

Chairperson requested each participant to write a line or two about one or more issues that should be addressed in the WG report. The issues proposed by the attendees were discussed and sixteen writing tasks were assigned. The drafts are to be submitted to the Chair and Vice Chair on or before March 9, 2001.

**I17: TRENDS IN RELAY PERFORMANCE**

**Chair: Mark Carpenter**

**Vice Chair:**

**Established: 2000**

**Output: Report**

**Expected Completion: 2002**

There was background discussion on the Transmission Protective Relay System Measuring Criteria that was developed by Working Group I3. Several companies agreed to provide the data for 2000 for their respective systems. It is desired to accumulate additional performance data from companies outside the PSRC; however, the mechanics to make that happen are not clear.

**I18: HARMONIZATION OF IEEE C37.90.2**

**Chair: Jeff Burnworth**

**Vice Chair: Bill Higinbotham**

**Established: 2000**

**Output: Revision of C37.902**

**Expected Completion: 2004**

The comments received from the recent reaffirmation balloting were reviewed and discussed, along with the differences in test requirements between C37.90.2 and EN61000-4-3. After lengthy

discussion, the working group concluded to revise the standard in a manner to harmonize with both the IEC and the revised/new C37.90.1 and C37.90.3 standards.

#### **I19: ANALYSIS OF SUBSTATION DATA**

**Chair: L. Smith**

**Vice-Chair: Bruce Pickett**

**Established: 1995**

**Output: Special Publication**

**Expected Completion Date: 2001**

Did not meet.

#### **Task Force Reports:**

ITF1 Relay Service Letter Database: J. Ingleson. Needs input. Request for input to be placed on WEB page.

#### **Liaison Reports:**

Instrument Transformers Subcommittee of the PES Transformers Committee: Jim Huddleston III. Nothing to report.

P420 IEEE Standard Design and Qualification of Class 1E Control Boards, Panels, and Racks Used in Nuclear Power Generating Stations: Cliff Downs. No Activity.

Power System Planning and Implementation Committee: No liaison.

#### **Coordinator's Reports:**

P384-NPEC, IEEE Standard Criteria for Independence of Class 1E Equipment and Circuits: Munnu Bajpai. No activity to report.

Revision of C57.13-1993 IEEE Standard Requirements for Instrument Transformers (Tom Nelson, chairman): Jim Huddleston. Nothing new to report.

Proposed C57.13.6 Instrument Transformers for Use with Electronic Relays and Meters (Chris Ten-Haagen, chairman): Jim Huddleston.

#### **Old Business:**

A task force meeting will be held to discuss IED firmware Quality Assurance.

#### **New Business:**

End of Minutes of Subcommittee "I."

#### **J: ROTATING MACHINERY PROTECTION SUBCOMMITTEE**

**R.D. Pettigrew, Chairman**

**S. P. Conrad, Vice Chairman**

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

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

**G. Benmouyal, Chairman**

**E. Fennell, Vice-Chairman**

**Established: 1996**

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

**Expected Publication Date: December 2001**

**Status: Working on Draft 5**

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

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

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

### **J2: AC MOTOR PROTECTION TUTORIAL**

**S. Zocholl, Chairman**

**(Vacant), Vice-Chairman**

**Established: 1998**

**Output: Tutorial on AC Motor Protection**

**Expected Completion Date: 2001**

**Status: Reviewing Working Group Assignments**

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

3.1 Locked rotor Protection – George. Parr

3.3 Differential Protection – Cliff Downs and Sahib Usman

3.7 Synchronous Motors – Phil Waudby

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

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

Miroslav Rustic joined the WG as a new member.

### **J3: REVISION OF THE AC MOTOR PROTECTION GUIDE**

**J.D. Gardell, Chairman**

**M. Bajpai, Vice-Chairman**

**Established: 1993**

**Output: Standard Revision IEEE/ANSI C37.96**

**Expected Completion Date: 2000**

**Status: Resolving Ballot Issues**

Five members and 7 guests attended the Working Group meeting. The results of the recent Guide re-circulation were discussed. It was decided that since the wording of sub-clause 5.9, Surge Protection Devices, could not be agreed upon, the text would be removed and a reference would



be made to the appropriate C62 Standard. The Rotating Machinery Subcommittee and the PSRC Officers approved this course of action.

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

**S. Patel, Chairman**  
**K. Stephan, Vice-Chairman**  
**Established: 1998**  
**Output: Transaction Paper**  
**Expected Completion Date: 2001**  
**Status: Forming Draft 0**

The WG met with 10 members and 18 guests.

Four writing assignments received since the September meeting were discussed.

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

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

#### **J7 REVISION OF GUIDE FOR GENERATOR GROUND PROTECTION GUIDE**

**J.T. Uchiyama, Chairman**  
**R. Das, Vice-Chairman**  
**Established: 2000**  
**Output: Standard Revision IEEE C37.102-1987**  
**Expected Completion Date: 2004**  
**Status: New Working Group being formed**

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

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

#### ***Liaison Reports***

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

No report given.

#### ***Coordination Reports***

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

No report given.

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

No report given.

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

No report given.

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

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

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

**Old Business**

**New Business**

New Member: Kevin Stephan agreed to join the Subcommittee.

**K: SUBSTATION PROTECTION SUBCOMMITTEE**

**Chair: S. R. Chano**

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

The Subcommittee met in Austin, TX on January 10, 2001, with 17 members and 15 guests present. The minutes of the previous meeting in Andover, MA were approved with a modification to indicate that TF K7 is now WG K7.

**ITEMS OF INTEREST FROM THE ADVISORY COMMITTEE MEETING:**

1. Reaffirmation of standards; The existing standard or guide can be extended until the working group has finished their work. If no PAR is created, then a standard may still have to go through the reaffirmation process.
2. Life of a PAR: A PAR dies at the end of the year of its 4 year cycle. By the end of the year 2003, there will be electronic balloting for all guides and standards.
3. The subcommittee webpages will be changed. All reports will appear on the PES PSRC webpage to eliminate problems with keeping everything up to date.
4. Subcommittee minutes are due by the end of the month following a PSRC meeting. For the January meeting the minutes are due by the end of February, May is due by the end of June, and September is due by the end of October.
5. The scheduling of the PSRC meetings was discussed. It was decided that the PSRC is happy to keep meeting 3 times per year.
6. All K subcommittee members who are qualified for senior IEEE membership are encouraged to apply.
7. Mohamed Ibrahim has been elevated to a Fellow in the IEEE.

**K1: PROTECTION OF PHASE ANGLE REGULATING TRANSFORMERS.**

**Chair: Mohamed Ibrahim**

**Vice Chair: Frank Plumptre**

**Established, 1999**

**Expected Completion Date: 2000**

**Output: Summary Paper**

The WG met for one session with 5 members and 3 guests attending. In addition to the completion of the special publication, K1 completed the summary paper and will issue it to the PSRC officers. The objective is to publish it in the IEEE 2001 summer meeting. The Chair has recommended that K1 be disbanded. It is the intent of the WG to revisit the need for a guide in about a year. The WG may also address new devices such as a single tank transformer at that time.

The Chair also indicated that he has been getting calls asking for information on phase shifting transformer protection and that he has been directing them to the webpage.

**K2: TRANSFORMER PROTECTION GUIDE****Chair: R. Hedding****Vice Chair: R.W. Haas****Established: 1991****Output: Revision of Standard ANSI C37.91****Expected Completion Date: 2000****Disbanded**

Disbanded

**K4: BUS PROTECTION GUIDE****Chair: S. P. Conrad****Vice Chair: R. W. Haas****Established, 1999 (Originally 1983)****Output: Revision of Standard ANSI C37.97****Expected Completion Date: 2000**

The WG did not meet in Austin, TX. The document is to be sent to the standards office in February. The guide will then be prepared for balloting.

**K5: NETWORK TRANSFORMER PROTECTION GUIDE****Chair: C. R. Sufana****Vice Chair: A. P. Napikoski****Established, 1994****Output: Revision of Standard ANSI C37.108****Expected Completion Date: 2002****Draft ballot**

Working Group K5 met in a single session with 8 members and 5 guests attending.

After introductions were made, the previous meeting's minutes were approved as presented. Charlie Sufana indicated that Vice Chair John Horwath will not be attending any future meetings due to a change in his job but will be continuing on as a corresponding member and asked for a volunteer to take over as Vice Chair. Tony Napikoski has agreed to help when he is available.

Discussion then centered on the status of the latest draft, which is draft 11. Charlie Sufana indicated that the latest draft is almost the final version. He has made changes in a few minor locations and updated the year to reflect the year 2001. He also said that an extension of the PAR has been received. The PAR has been extended until December 2002.

Charlie Sufana also indicated that almost all of the 7 negative ballots have been cleared. He told of how he is going back and documenting all of the requested changes in a more presentable form; including both affirmative and negative changes so that balloting body will know all of the changes. He is about 2/3 done with that documentation.

The group then reviewed as best they could an update to the C57.12.44-2000. Steve Conrad presented an excerpt from the new version of the guide but no one had a complete copy with him.

Charlie Sufana indicated he would try to track down the latest guide as quickly as possible and get everyone a copy of the clause in question; namely, 4.1.4.

The group then addressed the P1547 draft 06 changes. Bill Feero from the K10 working group presented comments from his working group meeting. Copies of the latest draft were handed out and the request was made get comments to Bill Feero by Wednesday if possible and no later than Friday at the latest.

The working group will be meeting in a single session at the May 2001 meeting and requests no overhead. It is anticipated that the IEEE HQ will have started the rebalancing process by that time

**K6: SHUNT CAPACITOR PROTECTION GUIDE Tutorial**

**Chair: Pratap A. Mysore**

**Vice Chair: Roger Hedding**

**Established,**

**Output: Revision of Standard ANSI C37.99 Tutorial**

**Expected Completion Date: 2002**

**Draft 0**

Working Group K6, Shunt Capacitor Tutorial, met in a single session with 5 members and 6 guest.

The assignment will be: To develop a tutorial presentation jointly with the T&D capacitor sub-committee related to the application and protection of substation shunt capacitor banks.

The Minnesota Power Systems Conference (MIPSYCON) planning committee has requested a presentation during the conference in November 2001.

Writing assignments were made and it is planned to have the first draft ready for presentation at the May meeting. The WG would like to know if the C37.99-2000 and 1036 guides would be sold at these conferences at a special price. Rick Taylor indicated something is in the works about special pricing but he had no other information at this time.

The WG plans to meet in a single session with 15 people and requests a computer projector.

**TF (K7): GUIDE FOR THE PROTECTION OF SHUNT REACTORS.**

**Chair: K. A. Stephan**

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

**Established, 1999**

**Output: Revision of ANSI/IEEE C37.109.**

**Expected Completion date: 2002**

**Status: Reviewing Draft 2**

The Working Group met in one session with 8 members and 4 guests.

Draft 2 which includes revised drawings and additions to several clauses was reviewed. Major topics of discussion included clarifying the clause on shunt reactor protection interaction with faults on series compensated lines and adding a summary of shunt reactor relay protections.

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

**Expected Completion Date: 2000**

**Output: Revision of ANSI Standard C37.95**

**Draft 8**

The WG did not meet as the work is in the final stages. The document was submitted to the IEEE headquarters for final approval. It is unknown if the WG will want to meet in May. Moh Sachdev said there were a few negative ballots and that there may have been resolved. Frank Plumtree said they were not done yet.

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

**Chair: William Feero**

**Vice Chair: Doug Dawson**

**Established, 1999**

**Expected Completion Date: 2001**

**Output: Standard through the SCC 21**

The WG met with 13 members and 11 guests. Comments for P1547 draft 6 were discussed during the meeting. The WG addressed comments that may result in a negative ballot. General consensus is that if the comments are accepted that the document will pass. The issue about secondary network protectors may have been resolved. P1547 balloting is to be started by the end of the month. Simon Chano asked for those who wanted to be on the balloting body to send an email indicating that to Moh Sachdev. Kevin Stephan and Vahid Madani volunteered and are to send an email to Moh. Bill also indicated that he has a few copies of P1547 draft 6.

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

**Chair: A. F. Elneweih**

**Vice Chair: F. P. Plumtre**

**Established, 1999**

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

**Expected Completion Date: 2003**

**Draft 1**

The Working Group met in two sessions with 9 members and 5 guests in attendance. The first draft was reviewed. Some WG assignments have still not been completed. These plus the new assignments are to be completed within six weeks from the meeting. The WG continues to be in direct contact with the 824 working group for coordination purposes.

The WG requests two sessions for 10 to 15 people and does not require any AV. equipment. They also request no conflicts with Working Groups C11 and I14.

**Liaison Reports:**

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

The Transformers Committee met in Nashville April 2-5, 2000. The Committee had five affirmative ballots since the Monterrey meeting listed below, one recirculation, one new, and three re-affirmations. (Note: The Niagara Falls October meeting minutes are not available yet).

- P1277/D11 "Trial-Use General Requirements and Test Code for Dry Type and Oil-Immersed Smoothing Reactors for DC Power Transmission" –Recirculation.
- ANSI/IEEE C57.94 "IEEE Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type General Purpose Distribution and Power Transformers" – Reaffirmation.
- PC57.136/D11 "Guide for Sound Level Abatement and Determination for Liquid-Immersed Power Transformers and Shunt Reactors Over 500kVA"
- IEEE C57.109-1993 "IEEE Guide for Liquid-Immersed Transformer Through-Fault-Current Duration" – Reaffirmation.
- PC57.116 "IEEE Guide for Transformers Directly Connected to Generators" – Reaffirmation.

In addition, the Committee is concerned about handling the C57 Standards that are copyrighted by either NEMA or ANSI, because IEEE will not indemnify IEEE members working on such Standards, which is also a PSRC concern.

Coordination for WG PC57.12.01 (Revision of C57.12.01-1998 Standard General Requirements for Dry-Type Distribution and Power Transformers Including Those with Solid Cast and/or Resin-Encapsulated Windings.

The W. G. was informed that the latest copy of this document had been submitted to IEEE HQ for balloting. There being no new business, the WG adjourned. This is my last report on this WG unless otherwise directed.

The WG PC57.12.59 Revision "Guide for Dry-Type Transformer Through-Fault Current Duration". Paulette Payne, Chairman has issued an Invitation to Ballot this document, *electronic ballot only*, due on or before January, 21, 2001.

## **Coordination Reports:**

### **1. ANSI/IEEE Switchgear Standards F. Plumtre.**

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

-Nothing to report

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

Nothing to report

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

Nothing to report

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

The IEEE Standards Board, at the request of the SPDC, has extended the PAR for this project to December 2002.

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

Nothing is reported.

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

Nothing is reported

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

Nothing is reported

**8. 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.

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

Nothing is reported.

**10 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.

**11 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

**Old Business**

Several guides are to be completed in 2001. It is hoped that the guides for WG K4, K5, and K8 will be completed this year.

**New Business**

K1 may return in about a year to develop a guide for phase shifters.

Simon Chano suggested forming a WG on breaker failure protection. There is a need to discuss modern protection in which the new relays have breaker failure in the relay. He asked how does this new protection impact the breaker failure schemes? Other topic areas that could be addressed include: the use of SF6 breakers (Mohamed Ibrahim), the coordination between electromechanical relay dropout and the breaker failure relaying, different methods to accomplish breaker failure protection (Vahid Madani), and should breaker failure be a control function or a protection function, i.e. inside the breaker control (Roger Hedding). Doug Dawson indicated that there is a prior paper which has been produced and a guide would be a good thing to have.

Simon Chano asked whether there is anything in the trip circuit design. Doug Dawson indicated that there is nothing about breaker failure.

Simon Chano asked if a task force should be created. The subcommittee voted to create a task force starting in May 2001. The objective is to report back to the subcommittee to reaffirm the assignment and find out the issues. Roger Hedding has volunteered to be the task force chair.

Simon Chano then presented an idea to have a new WG on multifunction protective relays and how they impact the substation. Mohamed Ibrahim said that there are issues about using the relays to compensate for magnitude and phase angle for differential circuits and it is easy to overlook something so there may be a need to redo it the old way to make sure one knows which way to set the relay. Inrush is another issue. The slope used to be fixed but now the new relays have that setting wide open and the user may not be experienced as to how to set the correct slope based on inrush.

Simon Chano said the new relays have all of the types in one box and there is an application concern, particularly on primary and backup protection.

Vahid Madani asked that the WG should look into how to bring the information into the relay from the transformer.

John Appleyard then commented that it seems to be a need to revisit transformer protection guide; should the transformer protection guide be changed to discuss the new protection functions? Roger Hedding recommended that data be collected for the next update of that guide. Steve Grier says the transformer protection guide does cover some of the new protection schemes.

At Simon Chano's suggestion it was decided to wait for more experience to be gained on the subject.

Charlie Henville suggested having the transformer and phase shifter guides combined and perhaps have the multifunction relays incorporated into the resulting guide. Simon Chano asked everyone to think about it some more so when the revisions come along they can incorporate these issues. A task force is to be created in the future.

Items that could be in any new transformer guide could include: how wiring the CTs the old way effects the DFR records and burden (Charlie Henville), making sure the correct reference winding is used (Vahid Madani), and what pitfalls to avoid when setting the overcurrent and differential elements (Steve Conrad).