

**POWER SYSTEM RELAYING
COMMITTEE**

OF THE

**IEEE POWER ENGINEERING
SOCIETY**

MINUTES OF THE MEETING

January 12-15, 1998

Savannah, Georgia

MAIN COMMITTEE MEETING OF THE POWER SYSTEM RELAYING COMMITTEE
Savannah Marriott Riverfront, Savannah, Georgia
THURSDAY, January 15, 1998
8:00 A.M. - 12:00 NOON

I. CALL TO ORDER ***R. W. Dempsey***

Chairman Bob Dempsey called the meeting to order on Thursday, January 15, 1998.

II. APPROVAL OF MINUTES ***G.R. Nail***

The minutes of the Quebec, CA meeting were approved.

III. FINANCIAL REPORT ***G.R. Nail***

Available on request.

IV. REPORTS OF INTEREST

A. PSRC Technical Paper Coordinator's Report ***A. G. Phadke***

The two panels sponsored by the Power System Relaying Committee will be held on Tuesday and Wednesday afternoons (2:00-5:00 PM) in Tampa at the Winter Power Meeting. The details of the panels along with the names of the contributors were listed in the Quebec City meeting minutes. All persons attending the Tampa Winter meeting are encouraged to attend these very important panels, and participate by presenting oral or written discussions. It is our intention to publish the panel papers and all written discussions and closures in a special publication of the PSRC. We will also sponsor a Poster Session in Tampa, with about a dozen papers of interest to the Relaying Committee. Please attend the poster session, and let me have your comments about the papers and the poster session in general. We expect to have about a dozen papers accepted during this round of paper reviews. This includes three PSRC committee reports. According to the new paper presentation guidelines, whether this new batch of papers will appear in the Summer Power Meeting in San Diego will be decided after the authors indicate their preference as to where they would like to present their papers.

B. Power Engineering Society Report ***Gary Michel***

The attendance for the Berlin 1997 Summer Power Meeting was 1426. This included PES and VDE registrants. The total North American registration was 591. A Second PES Chapters Congress was approved by the Governing Board. The meeting is scheduled to be held in conjunction with the 2000 Summer Power Meeting in Seattle. A PES FACTS Award was approved by the Governing Board. This award will be presented annually. The first award is expected to be presented in 1998. The title of the Plenary Session for the San Diego Summer Power Meeting was chosen. It is "Integrated Services Offered By Utilities." A new video tutorial is offered by PES/EAB. "Power Electronics and Motor Drives" is available for Chapter purchase at a reduced rate of \$ 50. with 0.5 CEU's available.

C. Cigre

C. Mozina

The last of Study Committee 34 (Power System Protection and Local Control) was held in Johannesburg, South Africa on September 24 to October 4, 1997. At this meeting colloquium sessions were held on the following Preferential Subjects:

- Preferential Subject #1: Recent protection, trends and experience in generator protection, monitoring and local control.
- Preferential Subject #2: Backup protection.
- Preferential Subject #3: Database organization for protection systems.

These colloquium sessions generated a total of 34 papers. If you would like a copy of a specific paper, please contact Chuck Mozina.

The next meeting of Study Committee 34 will be held in conjunction with the bi-annual CIGRE meeting in Paris, France on August 31st to September 4th, 1998. Two U.S. sponsored papers were accepted for presentation on the following preferential subjects.

- Preferential Subject #1: Present and future design of protection and substation control.
- Preferential Subject #2: The impact of deregulation in power systems on protection and control practices.

At the Berlin PES meeting, G. Ziegler (Chairman of SC34) met with the Chairman and Secretary of the IEEE PSRC (J. Dempsey and A. Phadke) to discuss ways of furthering cooperation. It was decided that this would be most usefully achieved with respect to studies of system disturbances, in relation to the activity of WG34.09. M. Mackey (convenor WG34.09) will be a panelist for a panel session on this subject at the 1988 PES Winter Power Meeting in Tampa, FL. The growing level of cooperation between, SC34 and PSRC is highlighted by two IEEE Working Group reports being first-presented as 1997 SC34 colloquium papers.

D. EPRI

L. L. Mankoff

No report for this meeting.

E. IEC Report

E.A. Udren

The IEC has been actively updating its environmental withstand test standards suite to align with generic EC requirements in familiar and new areas, as reported in September. The US has been voting on many such standards projects in recent months, with more coming, as summarized below. There were also a number of active projects not related to electrical environment. The TC 95 held a plenary meeting in New Delhi, India in October at which decisions were made on many of these projects, as listed with each of the following. For details on any of these activities, get in touch with Eric Udren.

ACTIVITIES RELATED TO RELAY ELECTRICAL ENVIRONMENT

**95/57/CD – Committee Draft Standard IEC 60255-22-3
Radiated EMI Immunity Tests**

**95/54/NP (New work proposal):
Conducted EMI Tests – to create IEC 60255-22-6**

**95/55/NP (New work proposal)
Power Frequency Interference Tests**

**95/59/CD – Draft IEC 60255-25
Electromagnetic Emission Tests for Electrical Relays**

95/63/NP – Summary Listing of EMC Testing Requirements for Relays

**95/50/CD - Insulation Coordination for Measuring Relays and Protection Equipment -
Requirements and Tests – IEC 255-5.**

95/52/SR – Systematic Review of 255-22-4, Fast Transient Disturbance Test.

ACTIVITIES NOT RELATED TO ELECTRICAL ENVIRONMENT

**95/58/CD – Draft IEC 60255-24
COMTRADE – Common Format for Transient Data Exchange**

Revision of IEC 255-3, Time Dependent [inverse-time] Relays

**95/51/CD - Predicted Availability, Reliability, and Maintainability of Static Protection
Equipment.**

95/52/SR – Systematic Review of IEC 255-8, Thermal Electrical Relays.

IEV Dictionary Revisions

1/1683/CD IEV Chapter 444: Non specified time all-or-nothing relays

1/1684/CD IEV Chapter 445: Specified time all-or-nothing relays

1/1685/CD IEV Chapter 447: Measuring relays

TC 57 Liaison – Reports that 1870-5, Part 103, Companion Standard for Transmission Protocols for Protection and Control, has become an IEC Standard.

The IEC WG met with seven members and three guests. The attendees reviewed a long list of active IEC standards activities as described in detail in the IEC Report in the Main Committee minutes, also appended to this WG report to the SC. The only documents currently up for voting are the three lengthy TC 1 documents containing chapters of the IEC Dictionary relating to relays. Those interested in reviewing the definitions should request copies from E. Udren; comments are needed by the middle of February.

F. Substations Committee Working Groups

J. McDonald

No report for this meeting.

G. Standards Coordinator's Report

M. Sanders

At the May 1997 meeting in Williamsburg, there was a question brought up about the collections of the PSRC's standards. The Electronic Publishing Manager at IEEE has clarified the process by which the collection gets done. The Relaying Collections may include any live standard or any approved draft. Unapproved drafts are not included. The decision to reprint the collection is based on several considerations: how many copies are left in inventory since the last printing, how many new or revised standards there are, and recommendations of working groups, or subcommittees. When the collection is being assembled, the IEEE Production Coordinator contacts several people for recommendations of what standards should be included: the PSRC Chairman, staff engineers, liaisons and editors from IEEE. Any opinion we as the PSRC has will be considered. The last printing was in 1995 and our past Chairman, John Appleyard wrote the forward and was consulted for the content of the collection. The next printing will more than likely be within the next year.

There has been some further modifications to the new open balloting procedures as established by IEEE in 1996. Effective immediately, the following conditions apply:

- On the Invitation to Ballot, it is now requested that you certify that you understand the subject matter and that you are technically competent to ballot the standard.
- On Letter Ballots, failure to return a ballot will result in your name being removed from the invitation to ballot for future ballots.

For the PSRC, we are going to maintain a Balloting body that consists of the main committee members. Those who respond to the invitation to ballot of the particular PSRC Standard Project will be added to it's balloting body. What this means for you, if you are a member of the Main Committee, you must respond to the **ballot**. If you are not a member of the Main Committee, in order to ballot on a PSRC standard project, you must respond to the **Invitation to Ballot**.

IMPORTANT also effective immediately, in order to ballot on any IEEE standard or standard project, you must be a member of the IEEE Standards Association (IEEE-SA). An application was mailed out to you late last year. It requires a \$10 annual fee to belong. If you were astute and sent in your application before the end of last year, you would have received a free copy of the IEEE Dictionary on CD ROM. It is important that you join this association. This was a decision made in Berlin by the Technical Council of PES that we support this association. At the moment, the Standards Board does not have a way to track membership in the IEEE-SA, but they are working on it presently. If you want to ballot, please join the IEEE-SA **NOW!**

Some request have come to me concerning electronic Project Authorization Request forms. These are available, however be aware that for the near future, it will still be required to submit a hard copy with the appropriate signatures on it. You may find the PAR form under: <http://standards.ieee.org/guides/par/>. NesCom may required electronic submission by 1999. We have not been informed as to the need for actual signatures.

Standard Boards Activity

1. PARs to be submitted:

- PC37.90.3 Standard Electrostatic Discharge Tests for Protective Relays
- PC37.90.1 Revision of Standard Surge Withstand Capability Tests for Relays and Relay Systems Associated with Electric Power Apparatus. (Changing title of Standard to be consistent with the title of C37.90)

- PC57.13.3 Guide for the Grounding of Instrument Transformer Secondary Circuits and Cases
 - PC57.13.1 Guide for Field Testing of Relaying Current Transformer
2. PAR Submittals
 - None
 3. PAR Approvals
 - None
 4. PAR Expirations coming up
 - None
 5. PAR Extensions
 - PC37.90 Standard for Relay and Relay Systems New date: June 1999
 - PC37.96 AC Motor Protection New date: 12/1999
 6. PAR Withdrawals
 - PC37.107 Digital Protective Relay System Interface
 - PC37.97 Guide for Protective Relay Applications to Power System Buses,
 7. Standards in Balloting Process
 - PC37.91 Transformer Protection Guide
 - PC37.96 Motor Protection Guide
 - PC37.111 COMTRADE
 - C37.105 Standard for Qualifying Class 1E Protective Relays and Auxiliaries for Power Generating Stations (Reaffirmation)
 - C37.98 Standard for Seismic Testing of Relays (Reaffirmation)
 8. Standards Submitted to Standards Board
 - None
 9. Standard Approvals
 - None
 10. Standard Extensions
 - C37.91 Guide for Protective Relay Applications to Power Transformers, June 1999
 11. Standards in need of review
 - None
 12. Reaffirmations needed
 - C37.93 Guide for Power Systems Protective Relay Applications of Audio Tones over Telephone Channels (Feb 6, 1998)
 - C57.13.3 Guide for the Grounding of Instrument Transformer Secondary Circuits and Cases (Oct 31, 1997)
 - C57.13.1 Guide for Field Testing of Relaying Current Transformer (Oct 31, 1997)
 13. Reaffirmations granted
 - None
 14. Standards Withdrawn
 - C37.97 Guide for Protective Relay Applications to Power System Buses

Standards Board Meeting Schedule:

PAR/Standard Submittal Deadline
 February 6, 1998
 May 8, 1998
 August 7, 1998
 October 30, 1998

Standards Board Meeting
 March 18, 1998
 June 24, 1998
 September 15, 1998
 December 6, 1998

Coordination Requests

Switchgear:

PC37.48.1 New Standard: A Guide on the Operation, Classification, Application, and Coordination of High Voltage Current Limiting Fuses, No coordination requested

PC37.20.4 Revision of Indoor AC Switches (1 KV - 38 KV) for use in Metal-Enclosed Switchgear, No coordination requested

PC37.71, Revision of Standard for Three-Phase Manually Operated Subsurface and Vault Load Interrupting Switches for AC Systems, no coordination requested

PC37.14a Revision of Low-Voltage DC Power Circuit Breakers used in Enclosures, no coordination requested

Energy Development & Power Generation:

(No #) New Standard for Recommended Practice for the Electrical Design and Operation of Fuel Cell Power Plants, no coordination requested

P421.5 Revision of Recommended Practice for Excitation System Models for Power System Stability Studies, no coordination requested

Surge Protective Devices:

PC62.45 Revision of Guide on Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits, no coordination requested

Insulated Conductors:

P400.1 Revision of Guide for Making High-Direct-Voltage Tests on Shielded Power Cables Systems in the Field, no coordination requested.

P400 Revision for Guide for Field Testing and Evaluation of the Insulation of Shielded Power Cable Systems, no coordination requested.

(No #) Revision of Standard for Cable Joints for Use with Extruded Dielectric Cable rated 5000-138,000 V and Cable Joints for Use with Laminated Dielectric Cable rated 2,500 - 50,000 V, no coordination requested.

P1235 New Standard for Guide for the Properties of Identifiable Jackets for Underground Power Cables and Ducts, no coordination requested.

P851 Revision of Guide for Application of Flame Retardant and Arc Resistant Blankets, Coating and Tapes, no coordination requested.

(No #) New Standard for Guide for Investigating and Analyzing Power Cable, Joint, and Termination Failures on Systems Rated 5 kV through 46 kV, no coordination requested.

(No #) New Standard for Solder-Sweated Split Tinned Copper Connectors, no coordination requested

Transformers:

PC57.12.60 Revision of Test Procedures for Thermal Evaluation of Insulated Systems for Cast and Resin-Encapsulated Power and Distribution Transformers, no coordination requested

PC57.12.40 Revision of Requirements for Secondary Network Transformers, Subway and Vault Types (Liquid Immersed), no coordination requested.

PC57.12.01 Revision of Standard General Requirements for Dry-Type Distribution and Power Transformers Including Those with Solid Cast and/or Resin-Encapsulated Windings, no coordination requested

(No #) New Standard for Guide for the Definition of Thermal Duplicate Liquid Immersed Distribution, Power and Regulating Transformers, no coordination requested.

PC57.106 Revision of Acceptance and Maintenance of Insulating Oil in Equipment, no coordination requested

PC57.13.6 Supplement to C57.13, Accuracy and Burdens for Instrument Transformers that are to be used with Electronic Devices, coordination requested, need name.

Substations:

PC37.122 Revision of Standard for Gas-Insulated Substations, no coordination requested.

(No #) New Standard Recommended Practice for the Design of Flexible Buswork in Seismically Active Areas, no coordination requested.

V. COMMITTEE REPORTS

Go to specific Subcommittee reports on Minutes Web Page.

VI. Old Business

None.

VII. New Business

FUTURE MEETING DATES:

May 11-14, 1998	Salt Lake City, UT	Salt Lake City Hilton
September 14-17, 1998	Asheville, NC	Great Smokies Sunspree
January 11-14, 1999	Las Vegas, NV	Harrah's Hotel
May 10-13, 1999	Albuquerque, NM	Albuquerque Marriott
September 11-18, 1999	Louisville, KY	Camberley Brown Hotel
January 11-13, 2000	San Diego, CA	Mission Valley Hilton

Savannah Marriott Riverfront

January 1998 Meeting

Attendance List

If your company name is missing, you are not on the mailing list.

Attendee	Company
Mark Adamiak	G.E. Protection & Control
George Alexander	GE
Alex Apostolov	GEC Alsthom
T. Ayoub	Southern Company
Mike Baldwin	NPPD
M. Begovic	Georgia Inst. of Technology
Ken Behrendt	Schweitzer Eng. Labs, Inc.
Gabriel Benmouyal	Schweitzer Eng. Labs, Inc.
H. Bilodeau	Hydro-Quebec
John R. Boyle	Power System Analysts
John Brown	Utility Tech Engineers
Larry Budler	NPPD
John Burger	AEP
Bob Burnett	Georgia Power
Jeff Burnworth	Basler Electric Company
Hans Candia	ABB High Voltage Systems
Mark Carpenter	TU Electric
Pat Carroll	Wisconsin Electric Power
Carlos H. Castro	PSE&G Company
Jack Chadwick, Jr.	Consultant
Simon Chano	Hydro Quebec
George Chirco	Powertec Industries
Steve Conrad	Public Service Co. of N.M.
Al Darlington	Consultant
Douglas Dawson	Consultant
Robert Dempsey	Potomac Electric Pwr. Co.
Thomas J. Domin	Pennsylvania Pwr & Light
Paul R. Drum	Duke Power Company
Clare Duffy	GEC Alstrom
Walter A. Elmore	ABB Power T&D Co.
A. Elnewihi	BC Hydro
Will English	Electrocon
J. Estergalyos	BPA
Bill Feero	ERM
Charles Fink	Entergy
Charles Froman	Houston Lighting & Power
Jeffery Gilbert	Pennsylvania Pwr & Light
Harley Gilleland	The HagGil Group
Adly Girgis	Clemson University
A. T. Giuliante	ATG Exodus
J. Gosalia	Doble Engineering
Steve Grier	Dayton Power & Light
T.Griffin	Duke Power Company

Bob Haas	Consultant
D. Hamai	WAPA
John E. Harder	Application Consultant
R. E. Hart	Seattle City Light
Wayne Hartmann	GEC ALSTHOM
I. Hasenwinkle	Relay Engineering Service
Charles Henville	B C Hydro
Willy Hermans	Electrabel
W. Higinbotham	RFL
Gary Hoffman	GEC ALSTHOM
Jerry Hohn	Indianapolis Power & Light
Dan Hollands	Qualitrol
R. Holmgren	ComEd
Dennis K. Holstein	SRS Technologies
S. H. Horowitz	Consultant
John Horwath	Commonwealth Edison
J.D. Huddleston III	Consultant
Chris Huntley	NORTELE LENTRONICS
Mohamed Ibrahim	New York Power Authority
F. Ilar	ABB Network Partner
M. Ilar	ABB Network Partner
Jim Ingleson	New York Power Pool
Barry Jackson	Duke Power Company
D. Jakominich	Siemens
Dave Jamison	Detroit Edison
Bob Jones	Rochester Gas & Electric
Ed Kalkstein	Kaltech Associates
D. Karlsson	Sydskraft AB
P. Kerrigan	GE
Mladen Kezunovic	Texas A&M University
C. Kinne	Northern States Power
R. Kochhar	Seattle City Light
Joe Koepfinger	Duquesne Light
Ljubomir Kojovic	Cooper Power Systems
Bill Kotheimer	Kotheimer Associates
Peter A. Kotos	General Electric
Kevin C. Kozminski	Pacific Gas & Electric
Edward Krizauskas	NY State Elec. & Gas Corp.
Prem Kumar	Bechtel
Paul Lerley	Basler Electric
John Linders	Consultant
D. Loudermilk	Universal Power Products
Bill Lowe	Northern States Power
Fidel Marquez	Commonwealth Edison

B: ADVISORY COMMITTEE

R.W. Dempsey, Chairman

A. Phadke, Vice Chairman

January 13, 1998 Meeting

Expected Completion Date: Continuous

The main issues that were discussed during the Advisory committee meeting were meeting days, our educational initiatives, and our new members selection for the Main Committee membership. It has been suggested that we move up the start of our meetings to Sunday, to take more advantage of weekend airfares and other discounts. With our existing contracts giving us commitments through 2000, there is not anything that can be done for now. We are going to review how this could work and if it would be of benefit to our attendees.

We are also increasing our educational initiatives. This includes presentations at the main meeting, our "Ask the Answer Man" session, and other programs. We are also working on setting up the internet to take questions in advance of our meetings. We welcome your feedback.

We will also soon be communicating directly on a new "initiative" to develop a "Standards Association" that everyone **MUST** join in order to ballot the standards we develop. This has been put in effect, and everyone must pay \$10 to be a member. We will be discussing this some more at our May meeting in Salt Lake City.

B1: AWARDS AND TECHNICAL PAPER RECOGNITION

M.S. Simon, Chairman

B. Nelson, Vice Chairman

Expected Completion Date: Continuous

The Awards and Recognition Working Group met to begin the process of selecting the PSRC nominees for the IEEE Baker, Fink and Thompson prize paper awards. The Baker award is for an outstanding transactions paper published during 1997. The Fink award is for an outstanding survey review or tutorial paper published during 1997. The Thompson award is for an outstanding published paper submitted while the author is under 30 years of age. The PSRC nominations are due to the PES by April 1, 1998. The following awards were presented by Mr. Dempsey at the Thursday Main Committee meeting.

Technical Council Awards for 1997.

1. **Ozair H. Mirza.** Prize Paper Award. "Usage of CLPU Curve to deal with Cold Load Pickup Problem"
2. **Moh S. Sachdev.** Power System Relaying Committee Distinguished Service Award.
3. **Eric A. Udren** Power System Relaying Committee Working Group Award or a Technical Report. Outstanding Working Group. "Line Protection with Digital Computers"
4. **Mark W. Conroy** Power System Relaying Committee Working Group Award for a Standard or Guide. Outstanding Working Group. "Application of Current Transformers for Relaying"

Technical Council Awards for 1996.

1. **Arun G. Phadke** Power System Relaying Committee Working Group Award for a Standard or Guide. Outstanding Working Group. "Power System Synchrophasor Standard"

Power System Relaying Committee Career Service Award for 1997.

1. **William C. Kotheimer** For Outstanding Leadership and Career Service to the Power System Relaying Committee.

(Certificates)

1. **S. C. Conrad**, Chairman of Substation Protection Subcommittee.
2. **M. S. Sachdev**, Chairman of Relaying Practices and Consumer Interface Subcommittee.

B2: FELLOWS AWARDS

J.S. Thorp, Chairman

Expected Completion Date: Continuous

The Working Group did not meet.

B3: MEMBERSHIP COMMITTEE

J. E. McConnell, Chairman

Output: Improve PSRC Participation

Expected Completion Date: Continuous

The officers and members of PSRC thank John for his efforts as Membership Committee Chairman and wish him all the best in his retirement. As the electric utility industry moves toward deregulation, we are concerned that utility membership will suffer. The PSRC Officers are looking for a utility member of the Main Committee to take over as the Chair of this committee. If you want to volunteer, contact George Nail.

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

Tom Wiedman, Chairman

Output: Update O/P Manual

Expected Completion Date: Continuous

WG Chairperson Resources WG met on Tuesday at noon with 13 WG and SC officers present. The 3 process flow diagrams were distributed. (rev date 1/8/98) These documents include revisions and cross references to O&P manual sections. The chairman will revise these documents to include meeting comments and PSRC officer comments. The WG officers would like to see the 1994 approved manual and a work-in-progress manual on the web site. This will be done by March 1. The work-in-progress document will include a Word 7.0 generated table of contents, index, and the process flow charts. Frank Plumtre will run the May meeting with the assistance of Mal Swanson.

B7: TECHNICAL PAPER REVIEW

J.S. Thorp, Chairman

No report

B8: BIBLIOGRAPHY AND PUBLICITY

T.S. Sidhu, Chairman

The working group met with five members and two guests present. The 1997 bibliography paper is 85% complete. A letter to be sent to various utilities for updating the Relay Engineers' mailing list was put forward by Jeff Burnworth. The WG members suggested few minor changes. Jeff Burnworth will send this letter to the various utilities following PSRC officers' approval. Compendium of papers is complete. WG members suggested that the PSRC officers should be consulted to determine the form in which it should be published. A brief report highlighting the 1997 activities of the PSRC has been sent to the Editor of the PES Review magazine for publication. NERC reports for 1996 and 1997 has not been mailed yet. Al Darlington and Mal Swanson will review the reports when received.

D: LINE PROTECTION SUBCOMMITTEE

J. A. Zipp, Chairman

R.M. Westfall, Vice Chairman

The Line Protection Subcommittee met in Savannah, Georgia on January 14, 1998 with 21 members and 29 guests present and chairman John Zipp presiding. The minutes of the Quebec City, Quebec meeting were approved. Tony Seegers and Patrick Carroll were welcomed as new subcommittee members. Vern Dvorak has resigned due to retirement.

D1: EFFECTIVENESS OF DISTRIBUTION PROTECTION

P. Carroll, Chairman

C. Fink, Vice Chairman

Established: 1994, Output: IEEE Paper

Expected Completion Date: 1999

Status: Draft #5

The working group met with 11 members and 15 guests. It was announced that Patrick Carroll would be the new working group chairman. The meeting began with a discussion of the more significant survey ballot comments received. It was generally agreed that most comments were editorial in nature and would not detrimentally impact the status of the survey. Comments related to software capabilities will be implemented where possible. The working group chairman volunteered to review the compiled list of comments and have them incorporated into the survey. The revised survey will then be sent to working group members for review and comment. It was suggested that future comments not be communicated within the survey due to survey response format limitations. It was also suggested that working group members complete the revised survey and a trial analysis be performed on the responses. Mailing list and survey mailout issues will be addressed at future meetings.

D2: FAULT LOCATING

Karl Zimmerman, Chairman

Demir Novosel, Vice Chairman

Established: 1996, Output: IEEE Guide

Expected Completion Date: 1999

Status: Draft #2

The working group met on Wednesday, January 14, 1998, with 11 members and 16 guests. Larry Budler of Nebraska Public Power District gave a presentation on NPPD's experience with a traveling wave relay for fault location on their transmission lines. Thanks to Larry for a very informative presentation. Draft #1 of the guide has been circulated to the working group, either by hard copy or e-mail. We received some comments, but would like to generate more feedback from the members. Therefore, we plan on compiling all of the comments already received, and send out a draft #2 to the working group for ballot. In order to illustrate some of the characteristics of different fault locating methods, we are adding a section of system examples. D. Tziouvaras, T. Seegers and K. Zimmerman agreed to work on this. D. Tziouvaras has a system that has already been modeled and is available in short circuit and EMTP formats. The new draft will be sent out by February 28, 1998.

D3: INSTANTANEOUS OVERCURRENT SETTINGS

J. R. Boyle, Chairman
K. Behrendt, Vice Chairman
Established: 1995, Output: IEEE Paper
Expected Completion Date: 1998
Status: Final Draft

The working group met with 8 members and 14 guests. The final draft was discussed and edited. The latest diagram that depicted the need to install directionally controlled ground relays on lines where the reverse fault current was higher than a forward line end fault will be modified to show a close-in line fault and a bus load. Also an additional reference will be added that will address cold-load pick up problems. After the changes have been made the paper will be submitted for publication.

D4: AUTOMATIC RECLOSING

W.M. Strang, Chairman
P.B. Winston, Vice Chairman
Established: 1996, Output: IEEE Guide
Expected Completion Date: 2001
Status: Current Draft #1

The working group met on January 13, 1998 with 14 members and 24 guests attending. The following business items were covered.

2. Draft #0 was distributed for informational purposes because it is still incomplete.
3. Two missing section drafts were submitted and the remaining sections are scheduled for submittal by January 30.
4. Table of contents (Mal Swanson), bibliography (Jim Huddleston), and index (John Zipp) writer volunteers were obtained.
5. During February, Bill Strang will integrate missing sections into draft #1 and distribute it to members and guests for comment in preparation for the May meeting.
6. Draft #1 will be sent by e-mail by Mike McDonald, made available for downloading from a web site operated by Charlie Sufana, and made available in hard copy by Bill Strang.
7. The success statistics on reclosing were submitted by Barry Jackson. An appeal was made for more data and five commitments were obtained. Paul Lerley suggested we use data from Working Group D1.
8. Jim Ingleson suggested we be more consistent with the terms automatic reclosing and autoreclosing. We will change the title, reinforce the definitions, be consistent with the nomenclature throughout the paper and coordinate a change in the PAR with John Zipp. Jim will lead the effort. Jim will also rewrite sections: introduction, and Phil Winston will coordinate mentioning torsion monitors in the generator applications.
9. Mal will obtain e-mail addresses and give to Charlie

D6: TRANSMISSION LINE PROTECTIVE SYSTEMS LOADABILITY

Tony Seegers, Chairman
J.B. Williams, Vice Chairman
Established: 1997, Output: IEEE transactions paper
Expected Completion Date: 2001
Status: New Working Group

The working group met on Wednesday, January 14, 1998, with 17 members and 8 guests attending. At this second meeting, a preliminary outline of the proposed transactions paper was discussed as well as the items desired in a survey. A loadability graph was presented by Brad Nelson as well as a WSCC relay work group report on "Application of Zone Three Distance Relays on Transmission Lines". For the next meeting, a survey questionnaire will be presented for comment. Writing assignments will be made at the next meeting. Three new members were added to the working group.

D14: TRANSMISSION LINE PROTECTION GUIDE

W.M. Carpenter, Chairman

A.N. Darlington, Vice Chairman

Established: 1992, Output: IEEE Guide

Expected Completion Date: 1998

Status: Draft #14

The working group met in double session with 17 members and 7 guests present. Draft #14 was reviewed. There were no negative ballot issues identified. The entire guide was covered, editorial comments received, and agreement was reached on all editorial changes. George Parr, George Alexander and Charlie Henville agreed to be responsible for the reference and bibliography section and their incorporation into the document. Steve Conrad agreed to draft some verbiage on line loadability and distance relay settings. An overview of the guide will be presented to the PSRC on January 15, 1998. We anticipate that the guide will be ready for ballot by March 1, 1998.

D15: HIGH IMPEDANCE FAULT DETECTION

A.P. Napikoski, Chairman

J.T. Tengdin, Vice Chairman

Established: 1997, Output: IEEE transactions paper

Expected Completion Date: 2001

Status: New working group

The working group met on January 14, 1998, with 12 members and 10 guests present. This was the second meeting of the working group with the present assignment. Much of the meeting involved a discussion on the best means of gathering information on high impedance events. This included both the mechanism and the source of information. Since most utilities do not presently track this information, we need to reach the right individuals in the utilities to start providing information, i.e. engineers, dispatchers, linemen. To help with this, John Tengdin will bring our efforts to the attention of the Transmission and Distribution Committee at the Winter Power Meeting. We will also be looking for participation from the utilities attending the PSRC. We spent considerable time reviewing and modifying a form for data gathering with the purpose of determining the minimum amount of information the working group was seeking on high impedance faults to assure maximum cooperation by not overburdening the process. There were two presentations made on high impedance events. Pat Carroll of Wisconsin Electric discussed a recent storm where over one hundred downed conductors were reported, though it was uncertain yet how many did not clear by conventional protection. Mark Adamiak reported on additional staged fault tests conducted by a utility in Valencia, Spain. One test involved a conductor in a tree, the first known test of this condition, which was eventually detected after about five minutes. Both members and guests are encouraged to make presentations or reports on high impedance faults and their utilities practices at future meetings.

LIAISON REPORTS_

- 1. Distribution Automation Working Group, Distribution Subcommittee, & D Committee, J. T. Tengdin, Liaison** Nothing to report.
- 2. P1124 - Guide for Analysis and Definition of DC Side Harmonic Performance of HVDC M. S. Sachdev, Liaison** No report.

COORDINATION REPORTS:

- 1. Design Guide For Improving Lightning Performance of Overhead Distribution Lines, Transmission and Distribution Committee - Roger Hedding, Coordinator.**

There was no meeting held at the Summer Power meeting. All negative ballots have been resolved. The paperwork has been completed and sent to the IEEE for review by the standards board.

Old Business: None

New Business:

Mladen Kezunovic presented an idea for a new working group "Reference Models for Transmission Line Relaying Studies". The proposed assignment is "Define power system models and event scenarios that can be used for the study of transmission line relay performance".

General Discussion:

Bob Dempsey presented the consequences of an undesirable relay operation on the Potomac Electric Power system.

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

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

Chairman: B. Nelson
Vice Chairman: M. Simon
Established: 1995
Output: Revision of IEEE 643
Expected Completion Date: 1998

H1 Working Group met on Jan 13th with 13 members and 10 guests. The working group assignment is to provide clauses 9 and 10 for the PLC application guide C643. Clauses 9 and 10 concentrate on the protective relay application of PLC. C643 is being revised by the PSCC. Roger Ray is the working group chairman. C643 will be meeting at the Winter Power Meeting in Tampa. The working groups discussion centered on incorporating comments and correction to clauses 9 and 10. Writing assignments were made to refine the Hybrid – Balancing Transformers section and produce figures to aid in the understanding of some of the “generic” system configurations. Figures from some existing papers may be used (with the author’s permission) where applicable. The addition of “Draft, Unapproved, Subject to change” terms will be added to each page of clauses 9 and 10 as they are in C643. The chairman discussed the direction of the PSRC chairman to remove safety references. The following writing assignments were agreed to:

10. Review the figures in the Ray/Sanders PLC paper. Dave Jamison
11. Revise the section on Hybrids and Balancing Transformers. Walt Seamon.
12. Provide Figure on the use of Voltage Transformers for channel timing. Kilyan Mustaphi

Writing assignments are due to the Chairman by February 28th. The chairman will compile the writing assignments along with the items discussed in the working group meeting and produce the “final” draft clauses. The finalized drafts will be distributed to working group members prior to the next meeting where “Working Group Consensus Balloting” will take place. All - Please forward any typographical comments to Brad. Please any comments to the Chair: (please note revised Email address) BradNelson@madison.wpl.com or by US mail to Brad Nelson, Wisconsin Power & Light, P.O. Box 192, Madison, WI, 53701-0192.

H2: COMTRADE STANDARD REVISION

Chairman: R. Ryan
Vice Chairman: C. Shank
Established: 1995
Output: Revised Standard C37.111-199x
Expected Completion Date: 1997

Report not available in time.

H3: COMTRADE USERS GROUP

Chairman: C. Shank
Vice Chairman: J. Sperr
Established: 1995

Output: COMTRADE Interpretations Paper
Expected Completion Date : Ongoing

The Working Group did not meet.

H4: Evaluation of Message Communications

Chairman: D. Holstein

Vice Chairman:

Established: 1997

Output: Standard

Expected Completion Date: 1999

H4 met in double session. Thirteen members and guests attended the meeting. Mason Clark will probably not be available to participate in H4. Dennis Holstein asked for a member of H4 to volunteer to be Secretary. At this time the position is open. After accepting the minutes of the Quebec City meeting, the first session concentrated on reviewing the project plan to develop PC37.115 "Standard Test Method for Use in the Evaluation of Message Communications between Intelligent Electronic Devices in an Integrated Substation Protection, Control and Data Acquisition System". Joe Koepfinger recommended some modification to the plan to improve clarity. This will be done. Dennis Holstein presented a liaison report describing the participation of Cigre Study Committee 34 Task Force 01, IEC TC57 Working Group 10, 11 and 12 and the PES Substation Committee C2TF4. Joe Koepfinger raised the question of how data and information was formally exchanged between PSRC and these organizations. The answer is through the common membership and electronic exchange via EMAIL and FTP Site posting. However, all information is in draft form and does not include either an EPRI or IEEE copyright notice. Koepfinger is concerned about the lack of copyright notification and will discuss the matter with Tom Wiedman. John Tengdin presented the results of analysis and simulation of for a LAN Loading Scenario. New simulations are currently being run and the results will be presented at the Utility Initiative meeting following PSRC on Thursday. Dennis Holstein presented information on how to access the SRS FTP site folder that contains the documents for H4's work. Also, an EMAIL exploder is available at SRS to facilitate the exchange of information for developing PC37.115. The procedure to subscribe to the EMAIL exploder was described and all members and guest were invited to participate. When the working draft of PC37.115 becomes stable, the Comment Tracking System (CTS) will be used to track and status the resolution of all comments. The next steps to prepare for H4's meeting in Salt Lake City are:

3. Scenarios from H5 are needed ASAP to be used for the first publication of PC37.115. Mark Adamiak will provide the electronic files that Dennis Holstein will post to the FTP site.

4. Dennis Holstein will post a modified outline for PC37.115 to include a section on common functional components and transaction sequences. A section for testing (new & modified systems and misoperations) will also be added to the outline.

5. Members should use the Build-to Specification that defines the procedure to map the requirements to transaction sequence and data object. SmartDOG software will be provided to the members to facilitate developing extensions to UCA specified data objects and to build new data objects.

6. Members should use the Interoperability Test Specification that defines "unit-under-test" configurations and client/server environments. These data and figures may be used to improve the readability and clarity of PC37.115.
7. Members should review and comment on all documents, recommend changes and send comments/changes to SCTS@srs.com. This mail exploder will send the EMAIL to all members subscribed in H4 work.
8. Dennis Holstein will post all work-in-process documents to the FTP site for H4.

H5: Application of Substation Peer to Peer Communications

Chairman: M. Adamiak

Vice Chairman: J. Beattv

Output: Paper

Expected Completion Date: 1999

The WG met with 29 attendees and reviewed drafts of peer to peer applications concerning distribution of voltage for calculation of power and the distribution of phase angle information in the control of breaker closing angles. A number of changes were recommended and passed on to the author. In general, suggestions were made to clearly state the assumptions that were used in describing a peer to peer application. Additionally, it was recommended that a section be added at the beginning of the document to state the overall assumptions that were used in compiling the scenarios. Some of these assumptions include:

- Redundant LAN
- Delivery speed to be as fast as 1ms
- High Accuracy Time sync is available
- The system shall survive any single contingency failure

The chairman will gather all remaining pieces of the document and will have a finished draft for the next meeting. Additionally, the chairman will assign review teams (with leaders) who will be responsible for bringing comments on the reviewed sections to the next meeting.

H7: HTF2: INTER RELAY COMMUNICATION PROTOCOL TASK FORCE

Chairman: G. Michel

Established: 1997

Expected Completion Date:

The PSRC Working Group met in Savannah, Georgia. Seventeen members and guests attended the single session meeting. The working group's task is to develop a standard for a fiber optic interface between communications multiplexers and protective relays. The minutes and a summary of past activities was distributed to each participant. In addition, the chairman announced that a PAR was submitted to the PSCC chairman. Bill Higinbotham of RFL reviewed a matrix summarizing data collected from presentations given by himself, Ken Fodero of Pulsar Technologies, Janusz Dzieduszkowski of ABB, Chris Huntley of Nortel, Ken Behrendt of SEL, and Gary Hoffman of GEC-Alstom. Most of this meeting was spent discussing the matrix. Considerable time was spent discussing protocol performance during multiplexer switching conditions. The following working group title, scope, and outline was provided to participants:

Title: Standard for Optical Fiber DS0 Interfaces Between Teleprotection and Multiplexer Equipment **Scope:** This Standard will describe the Interconnection Details for the DS0 Connection of Teleprotection Equipment to Digital Multiplexers using Optical Fiber. It will also describe the requirements for both physical connection and the communications timing.

Next Meeting The PSCC Working Group meeting is in the Herring Gull Room of the Tampa Hyatt Regency Hotel on Tuesday February 3, 1998 from 9 am to noon. **H7 WG Progress Report:** Bill Higinbotham developed a matrix that compares characteristics of each of the manufacturers approaches to the relay to multiplexer DS0 interface. Comments regarding the matrix have been solicited from the other H7 WG presenters.

H9: INTER SUBSTATION PROTECTION USING DIGITAL COMMUNICATIONS

Chairman: G. L. Michel

Vice Chairman: G. Pleinka

Established: 1993

Output: Transaction Paper

Expected Completion Date: 1997

The H9 Working Group met with the H7 Working Group. A ballot and attached working group paper was given to all working group members present. An electronic version will be sent to the two missing working group members and others that wanted a copy. The completed ballot is due to the Working Group Chairman March 1, 1998

H10: Revision of the Audio Tone Application Guide

Chairman: Ken Fodero

Vice Chairman:

Established: 1997

Output: Revised application guide

Expected Completion Date: 1997

This group met for the first time on January 13th for the first time. There were 17 people present. Of the 17 people present 10 people indicated that they would like to be members of the working group. The names of those people are: Chris Huntley, Bill Higinbotham, Jerry Hohn, Don Wardlow, Tim Phillippe, Veselin Skendzke, Jim Waldron, Mark Simon, Walter Seamon and Roger Ray. Paul Drum, who was not present, has indicated he would also like to be a member. This makes a working group of 11 people of which 5 are users and 6 are manufacturer related. Bill Higinbotham of RFL has volunteered to be the Working Group Vice Chairman.

The present guide is slated to be removed from the IEEE Standards list by Feb. 6th if no action is taken. It was concluded that we should ask for an extension of the standard while we are working on revising the guide. This action will keep the guide active and give the working group a period of three years to complete the revision. Miriam Sanders will be writing a letter to the Standards Board asking for the extension. Next the working group considered the working for the Scope in the Par. The agreed to Scope is as follows:

This guide contains information for power system protective relay applications of audio tones over voice grade channels. Included are sections on transmitting, receiving and interfaced equipment, voice grade channels, application principles, installation and testing. The title of

the Guide will also change. The new title will be "IEEE Guide for Power System Protective Relay Applications of Audio Tones over Voice Grade Channels."

This item is also required to be submitted with the Par. The purpose agreed to is as follows: Revise the present Guide, incorporate new technologies and review current voice grade channel characteristics. The Guide is to provide assistance to power system protection and communications personnel

- Newer classes of telephone circuits
- The public network is now digital, its effects of audio tones
- new modem technology in relaying tones
- configuration issues of a private network

Everybody was as to review the present document between now and the next meeting. They are to come to the meeting prepared to take on revision of sections of the present document plus new writing assignments.

Task Force Reports

HTF1: SWITCHYARD DATA ACQUISITION

Chairman: E. Udren

Established: 1996

Expected Completion Date: 1998

The Task Force exists to evaluate and contribute to the technical work of IEC TC 57 WG 12. The IEC WG is drafting the Process Bus or Switchyard data acquisition and control network portion of the proposed IEC Standard 61860 on Communication Networks Substation Control.

Liaison Reports

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

The next PSCC meeting is at the Winter Power Meeting in Tampa, FL.

2. Substation Committee - J. Tengdin

The Substation Committee will meet at the Winter Power Meeting in Tampa.

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

TC57 WG 12 has suspended its work pending the resolution core technical issues for the overall Substation System by WG 10 and 11. There is nothing new to discuss; the PSRC Task Force did not meet. The IEC TC 57 WG 10, 11 and 12 will meet next in San Diego on March 16 thru 19.

Coordination Reports

P1260 "Guide on the Protection, Measurement and Analysis of AM Broadcast Reradiation by Power Lines" - J. Zipp

No activity to report

C93 - Liaison Report on ANSI C93 Committee - W. Seamon

The ANSI C93 committee met at the Savannah Marriot Riverfront on January 15 through the 16th. There were six manufacturer representatives, the secretary from NEMA, and one user

present for the meetings. The first morning was devoted to reports from the secretary, chairman, and the new members from RITZ, who are in the coupling capacitor and CCVT business in Georgia. The Trench representatives were not present. RITZ is the only other manufacturer of these devices in the North America, except for Haefly Trench in Canada. Trench has not attended a C93 meeting for some time, although in October 1997 I discussed their interest in C93 with the Communications Seminar representative from Trench and was told that they would participate. I talked to their capacitor testing manager and was told that a last minute problem had prevented him from coming to Savannah. He will be at the next meeting in Washington in May 1998. A significant accomplishment of the committee was the printing of C93.5 - REQUIREMENTS FOR SINGLE FUNCTION POWER-LINE CARRIER TRANSMITTER/RECEIVER EQUIPMENT as an American National Standard. The members and those present for the meeting were presented copies by the acting secretary, Vince Baclauski of NEMA.

The committee reviewed a draft of an Annex to C93.1 American National Standard for Power-Line Carrier Coupling Capacitors and Coupling Capacitor Voltage Transformers(CCVT)-Requirements which I had written. This annex details the effect of the drain coil inductive reactance loading on capacitors with carrier accessories. After an extended discussion on the loading aspects of the drain coil and an update of the need to address this subject for the RITZ representatives, the draft was edited and a figure was generated to be added to the Annex.

The Friday meeting of the committee was devoted to a review of a proposed annex on the drain coil loading for C93.4- POWER-LINE CARRIER LINE-TUNING EQUIPMENT. The committee decide to essentially use the same annex in C93.4 as was used in C93.1, with the same figure. The C93.1 annex was reviewed to make the final version compatible with both documents. The remainder of the meeting was devoted to organizing C93.4 around the added equipment, such as filters, transformers, hybrids and the older version devoted primarily to line tuners. The section on ratings for all of the added devices and for the line tuners and tuning elements was organized. The members were asked to devise test circuits for the ratings involving insertion loss, return loss, impedance, isolation, and other rating parameters. The C93 PLC committee will meet at NEMA headquarters in Rosslyn, VA in late May 1998.

Cigre SC34 TF01 Liaison Report

No report available at this time.

Old Business

None.

New Business

TC 57 WG 5 W. Seamon

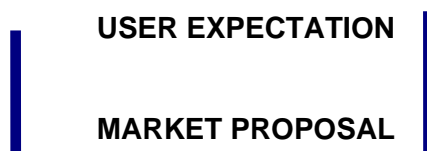
This WG is in the process of completing the revision of IEC 834-1, which is entitled: PERFORMANCE AND TESTING OF TELEPROTECTION EQUIPMENT OF POWER SYSTEMS- PART 1: Command Systems. This document was last revised by the working group meeting in Dresden in September 1996. A draft of the revised draft was sent to the members of the IEC in June 1997 for vote. In October 1997 I was advised that the Japanese delegation was scheduling a WG meeting in Tokyo the last week of November 1997. The short fuse of this schedule resulted in the acceptance of only two members as being able to attend. Therefore, the meeting was cancelled. The convener, Jim Murray of UK, informed me that there would be a

meeting somewhere in Europe in the middle of 1998 to address the comments that had been received from the China delegation and from some other sources. So far, the content of the comments and/or objections to the draft of IEC 834-1 have not been made available to the WG from IEC headquarters.

IEC-SB1 AHWGSA (Sector Board 1 - Ad Hoc Working Group Substation Automation - Joe Koepfinger

First meeting was held in Geneva 16-17 Dec. 97. Next meeting is to be 2-3 Feb. 98 in Firenze, Italy. The scope of this Ad hoc Working Group is:

- Establish medium term strategic vision and long term strategic vision in order to show the way to follow
- Establish these strategic visions by taking in to account both: - end user expectations (for new substations and for refurbishment of the existing substations and -technology potentialities as seen: - by the manufacturers of the automation systems)Control, Protection, Regulating and Monitoring supporting both maintenance and technical management) and- by the manufacturers of the major components (intelligence embedded in Switchgear, Power Transformers, Measurement Transformers, etc.



- Provide those involved with the several steps of development with this vision of the future target and thus prevent industrial risk of investment of time and money in uncertain directions
- **NB.** This type of guidance we intend to give to *relevant* TCs/SCs to solve Task 1

Technical Discussion and Structure of the Work to do

1 The following aspects resulted to be treated

Market needs

- a1) end user needs (current and future expectation)
- a2) manufacturers needs (mono-manufacturer solutions)
- a3) manufacturers needs (multi-manufacturer solutions)
- b) Standardization status of the relevant projected Standards
- c) Recommendations to give
- d) Structure of the work to do
- e) Key aspects and structure of the Report to produce.

2 Major attention has been paid to the identification of the medium term strategic visions and long term strategic visions as said in above Scope of Tasks. A solicitation was made for Panel Sessions to be presented at the PES meeting. Send any thoughts to Mr. Adamiak. Any ideas for a Guide, Standard or Paper that can be presented at PSRC should be forwarded to Mr. Adamiak. Any attendees that wish to be part of the balloting group for the work of H1 please contact Brad Nelson.

I: RELAYING PRACTICES SUBCOMMITTEE

J.L. McElray, Chair

Brad Nelson, Vice-Chair

The Relaying Practices Subcommittee met on January 14, 1998. Twenty-nine members and eight guests attended. Minutes of the previous Quebec City meeting were approved. Subcommittee (SC) members were reminded to download the previous meeting minutes and the new meeting agenda and bring them with to each meeting. The SC web page is <http://www.engr.usask.ca/~sachdev/rpnci/>.

I1: DIFFERENTIAL AND POLARIZING RELAY CIRCUIT TESTING

W.J. Marsh, Jr., Chairman

L. Smith, Vice-Chairman

Established: 1996

Output: Revision to IEEE Guide C37.103-1990

Expected Completion Date: 1998

The working group (WG) did not meet this time. The WG plans to meet next time.

I2: (G2): TERMINOLOGY USAGE REVIEW

B.L. Beckwith, Chairman

J.D. Huddleston, III, Vice-Chairman

Established: 1986

Output: IEEE Dictionary Updates

Expected Completion Date: Continuing

The WG did not meet this time due to a lack of topics to discuss.

I3: RELAY PERFORMANCE MEASURING CRITERIA

W.M. Carpenter, Chairman

L. Budler, Vice-Chairman

Established: 1996

Output: Special Publication

Expected Completion Date: 1999

The WG reviewed earlier definitions of what constitutes an "event," a "misoperation," and the general goals of the working group. The WG worked on agreement of numerous other questions, regarding how critical situations would be reported. After receiving a consensus on most of the key issues, seven utilities will put their respective utility data through the proposed new criteria. The idea is to generate questions in applying actual data to the new rules. These utilities agreed to review the 1997 data and attempt to apply the criteria to new 1998 data. A question was raised with reference to multiple simultaneous faults and how that situation would be reported in the database. A group was formed to develop criteria that would best serve the needs of the measuring criteria.

I4 (G3): IEC STANDARDS ADVISORY

Eric Udren, Chairman

M.M. Ranieri, Vice-Chairman

Established: 1989

Output: IEC Standards

Expected Completion Date: Continuing

The attendees reviewed a long list of active IEC standards activities as described in detail in the IEC Report in the Main Committee minutes. The only documents currently up for voting are the three lengthy TC 1 documents containing chapters of the IEC Dictionary relating to relays.

Those interested in reviewing the definitions should request copies from E. Udren. Comments are needed by the middle of February.

I5:(F9): TRIAL-USE STANDARD FOR LOW ENERGY INPUTS TO PROTECTIVE RELAYS

Peter McLaren, Chairman

Eric Udren, Vice-Chairman

Established: 1992

Output: Trial-Use Standard

Expected Completion Date: 1999

Eric Udren presented two pages of revision points for Draft 7.2, aimed at resolving and moving the project towards completion. Two key proposals are to drop the current-loop mode, which is not in use or proposed for use anywhere; and to make a statement of operating environment within the control house which defines reasonable and economic environmental withstand capabilities for the interface. The latter in turn defines shielding and grounding requirements, which have been elusive until now. Bill Kotheimer provided practical definitions for signal-to-noise ratio, dynamic range, and CMRR, which were discussed and adapted. Paul Lerley provided application guidance for switchyard-to-control house applications, which needs to be presented as an annex to the standard. The pre-meeting proposals and meeting results are to be incorporated in a major revision, Draft 8, which should be ready for final comments in September and WG formal acceptance.

I6:(G1): REVISION OF C37.90 - RELAY ELECTRICAL POWER APPARATUS

Mario Ranieri, Chairman

James Teague, Vice-Chairman

Established: 1993

Output: Revision of Standard ANSI/IEEE C37.90

Expected Completion Date: 1999

The WG reviewed C37.90 draft #2 and discussed sections 1-7 in detail. There are still items to be resolved and specific WG assignments were issued. The WG was requested to review in detail section 8 prior to the next meeting. The WG chair requested individual assignments be completed ASAP and he will follow-up by Feb 15th. Proposed corrections and changes for sections 1-7 and comments received on sections 8-10 will be sent to WG members for review prior to issue of draft #3. (PAR PC37.90 has been extended to June, 1999.)

I7:(E9): ELECTROSTATIC DISCHARGE TESTING FOR PROTECTIVE RELAYS

J. Teague, Chairman

M. S. Simon, Vice-Chairman

Established: 1992

Output: IEEE Standard C37.90.3

Expected Completion: 1998

Revised Version 7A of the current draft was distributed. Each change was discussed and reviewed. During the session there was discussion regarding the ESD "bleed off" circuit where there are differences between the IEEE C63 standard and the IEC 100x standard that I7 is trying to harmonize with. The WG reached consensus on adopting the IEC configuration but anticipate some comments when the standard goes to ballot. The WG chair will incorporate the changes discussed during this meeting and present them at the next meeting.

I8:(E10): SURGE WITHSTAND CAPABILITY (SWC) TESTS FOR PROTECTIVE RELAYS

J. G. Gilbert, Chairman

J. Teague, Vice-Chairman

Established: 1994

Output: IEEE Standard C37.90.1 (revision)
Expected Completion: 1998

Copies of draft 3C1 were distributed. Significant progress was made in reviewing and revising sections of the draft. At the end of the session the chairman requested a second session to continue the draft revision work. The second session continued on sections 2 through 8. Assignments were made for revisions to be incorporated into the next draft.

I9:(G4): TERMS USED BY POWER SYSTEM PROTECTION ENGINEERS

M.S. Sachdev, Chairman
Brad Nelson, Vice-Chairman
Established: 1990
Output: Special Publication
Expected Completion Date: 1998

The chairman reported that the PSRC officers approved the special publication. Dr. Phadke forwarded the final draft to the Chairman of the PES Technical Council for approval. The chairman of the Technical Council has tentatively approved the document, but the formal approval is pending. He needs an estimate of the sale price for the document. The price depends on the printing cost that is to be determined by the PES directorate. This information was solicited from the IEEE Headquarters but has not been received so far. The Chairman will follow up the matter with the IEEE Headquarters.

I10 (F7): APPLICATION OF CURRENT TRANSFORMERS FOR RELAYING

Mark Conroy, Chairman
Brad Nelson, Vice-Chairman
Established: 1988
Output: Guide IEEE/ANSI C37.110-1996
Expected Completion Date: 1998

Mark Conroy, chairman of this WG, resigned from the PSRC in November 1997. The WG vice-chairman will carry out the few remaining tasks for the WG. The summary paper based on the new ct guide has been completed. The PSRC officers have approved the paper. The paper was forwarded to the IEEE with a request for presentation. The rest of the WG meeting covered possible topics for future activities on cts. The WG will make an educational presentation at this Main Committee meeting in Savannah. The presentation summarizes the guide and presents some basic ct theory plus an example of ct application.

I11: RELAY TEST PRACTICES SURVEY

Jim Ingleson, Chairman
Ed Krizauskas, Vice-Chairman
Established: 1998
Output: Transactions Paper
Expected Completion Date: 2001

The WG held its first meeting. The WG will conduct a survey of relay test practices. A series of similar surveys has been conducted by past WGs of the PSRC. The survey form and results from the previous survey were distributed and discussed. A number of specific suggestions for the new survey were recorded. A list of goals for the new survey effort was set. The survey software purchased by the PSRC was discussed. Dr. Sachdev will host a preliminary home page.

I19: ANALYSIS OF SUBSTATION DATA

L. Smith, Chairman

C. Shank, Vice-Chairman
Established: 1995
Output: Special Publication
Expected Completion Date: 1999

The WG discussed the expected results of turning data into information. A list resulted which will be categorized and prioritized. There were two presentations: Alex Apostolov on "Data Sources for Fault Analysis in a Substation" and Mohammed Ibrahim on "Information Needed for the Analysis of System Disturbances".

Task Force Reports:

Relay Service Letter Database, J. Ingleson

The latest version of the relay-service letter database file is available on the Relaying Practices Subcommittee web site. An update is planned for February 1998. The current file is available in dBase (.dbf) and Excel (.xls) formats at the following address: "<http://www.engr.usask.ca/~sachdev/rpnci/>". A suggestion was made to create a hotlink for downloading the files from the PSRC main web page.

Review of C57.13.1 IEEE Guide for Field Testing of Relaying Current Transformers, and C57.13.3 IEEE Guide for Grounding of Instrument Transformer Secondary Circuits and Cases, Mike Meisinger

The consensus of ITF2 was that both guides require revision and two WGs should be formed to accomplish this. Because the I5 WG is also developing a trial-use standard on low energy inputs to protective relaying, the new WG for C57.13.1 should liaison with the I5 WG.

Liaison Reports:

Power Systems Engineering Committee: No activity to report.

IAS & I&CPS: A.C. Pierce No report was presented.

Instrument Transformer Subcommittee: Jim Huddleston III Nothing new to report since the previous PSRC minutes.

P420 Control Panels: Cliff Downs. No activity to report.

C37.100 Dictionary of Terms, M.S. Sachdev No further developments to report.

Coordinator's Reports:

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

P827R1-NPEC Ad-Hoc Criteria Safety Systems in Nuclear Plants, C. W. Fromen

According to IEEE HQ, standard 827 has been withdrawn. The last contact for the revision project was Linda Sue Boehmer, LSB Technology, PO Box 834, Clairton, PA 15025, 412-653-1082, LSBTEC@AOL.COM.

IEEE-765.D5 STD for Preferred Power Supply for Nuclear Power Generator Plants, Munnu Bajpai No activity to report.

T & D Committee No activity to report.

Old Business:

No issues were taken up.

New Business:

Two new working groups were formed. Mike Meisinger will lead I12 for revision of C57.13.1 IEEE Guide for Field Testing of Relaying Current Transformers. Mike McDonald will lead I13 for revision of C57.13.3 IEEE Guide for Grounding of Instrument Transformer Secondary Circuits and Cases. The Subcommittee Chairman and Vice-Chairman invite all interested participants to join these two working groups at the May meeting.

J : ROTATING MACHINERY PROTECTION SUBCOMMITTEE

P. W. Powell, Chairman

W.P Waudby, Vice-Chairman

The subcommittee met on January 14, 1998 with 13 members and 7 guests present. Minutes of the September 24, 1997 meeting in Quebec City, Canada were approved. The Chairman discussed briefly the items of interest from the Advisory Committee.

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

G. Benmouyal, Chairman

K. C. Kozminski, Vice-Chairman

Established: 1996

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

Expected Publication Date: Dec 1999

Status: Guide Extended, Draft 2 was reviewed.

The working group met with 16 members and 7 guests. Charlie Pensinger, Chairman of the Working Group that originated this guide, provided current WG members with historical information on the generator underfrequency limit curves. The discussion included insight into the resolution of initial issues. A discussion of the comments on Draft 2 of the revised Guide occupied the remainder of the session.

J3: REVISION OF C37.96, GUIDE FOR AC MOTOR PROTECTION

J. Gardell, Chairman

M. Bajpai, Vice-Chairman

Established: 1993

Output: Standard Revision IEEE/ANSI C37.96

Expected Completion Date: 1999

Status: Waiting to ballot.

The working group did not meet. John Appleyard continues to work with the PSRC Standards Coordinator to move the document through the balloting process.

J4: SEQUENTIAL TRIPPING OF GENERATORS

E. C. Fennell, Chairman

K C. Kozminski, Vice-Chairman

Established: 1993

Output: Transaction Paper

Expected Completion Date: 1996

Status: Publication Question Raised

Kevin Kozminski questioned why the paper has not been published in the IEEE Transactions. Phil Powell requested Arun Phadke to verify that the paper was submitted for publication and to determine its status.

J5: IMPACT OF LARGE STEEL MILL LOADS ON GENERATING UNITS

P. A. Solanics, Chairman

K. C. Kozminski, Vice-Chairman

Established: 1995

Output: Transactions Paper Expected Completion Date: 1998

Status: Reviewing third draft.

The working group met in single session with 5 members and 8 guests attending. Draft 3 of the transaction paper was discussed. There were no major issues with the draft. Some minor assignments were made to improve the draft. These assignments are due back in mid-February and will be incorporated into the paper. The Working Group will then ballot the WG and Subcommittee members.

J11: APPLICATION OF MULTIFUNCTION GENERATOR PROTECTION SYSTEMS

M. Yalla, Chairman

E. C. Fennell, Vice-Chairman

Established: 1994

Output: Transaction Paper

Expected Completion Date: 1999

Status: Resolving Ballots

The working group met in a double session with 15 members and 12 guests. The results of the draft #7 ballot were discussed. One negative ballot could not be resolved. The Chairman will write a letter to that Subcommittee member, describing the WG member's views on the negative comments. The Chairman will incorporate those comments accepted by the WG into the document to prepare it for comments of substance by the Main Committee.

Liaison Reports:

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

Chuck reports that an international meeting on drives was held. Also, they are starting to revise the standard on induction motors.

Coordination Reports:

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

Nothing to report.

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

No report given.

Old Business:

Stan Zocholl has agreed to chair the development of a motor protection tutorial. IAS has offered to furnish a representative to attend the WG meetings. The winter of 2000 is the target date for completion of the document.

New Business:

Chuck Mozina reiterated the need for a Working Group to review the performance of generator protection during power disturbances. The title would be: Generator Protection Response to Abnormal System Operation Conditions. The proposed assignment is to: Develop an IEEE transactions paper that provides technical guidance to organizations such as NERC and WSCC. This paper will provide information on application and settings of generator protective relays that can operate during major system disturbances such as those experienced in the Western US during the summer of 1996. Functional protection areas to be studied should include: System

Backup Protection (21 and 51V), Loss of Field Protection (40), Overexcitation Protection (24), Abnormal Frequency Protection (81) and Out-of-Step Protection (78). Al Pierce suggested writing a transaction paper on protecting low impedance grounded generators. This would include solutions to problems and recommendations to ANSI standards.

K: SUBSTATION PROTECTION SUBCOMMITTEE

C. F. Henville, Chair
S. R. Chano, Vice Chair

The Subcommittee met on 14 January, 1998, with 20 members and 16 guests present. The minutes of the previous meeting in Quebec were approved, as recorded.

K1: PROTECTION OF PHASE ANGLE REGULATING TRANSFORMERS.

Mohamed Ibrahim, Chair
Frank Plumptre, Vice Chair
Established, 1995
Expected Completion Date: 1998
Output: Transactions Paper

The WG met in two sessions to discuss a revised draft which now includes most of the figures. Revisions to the overall outline of the paper were agreed to. 14 members and 10 guests attended the meeting. Considering the present volume of the document (38pages) and the detailed discussions presented, the working group requested the approval of the Subcommittee to agree to a change in scope in the WG assignment from transactions paper to a guide. After discussion in the Subcommittee, it was agreed that the working group would change the intended output from a Transactions paper to a special publication. When the special publication is complete, the process to develop a guide will be initiated.

K2: TRANSFORMER PROTECTION GUIDE

M. P. Sanders, Chair
R.W. Haas, Vice Chair
Established: 1991
Output: Revision of Standard ANSI C37.91
Expected Completion Date: 1998
Draft 8

The working group met for an abbreviated meeting. The balloting body has been approved by the chair and the balance has been assured by the Standards Coordinator. The document has been forwarded to the Standards Board for balloting. This is the first document to be balloted by the new open balloting procedure established by the IEEE Standards Board. Phil Engel has done a great job in getting the coordination curves in electronic form. The chair wishes to thank everyone involved in this project and the hard work everyone put forth to revise the Standard. The results of the ballot are expected to be available by the next meeting. Roger Hedding has agreed to take over as Chair of the WG to facilitate the ballot resolutions and the document updates as may be required. Once the Standard has been approved and submitted to the Standards Board, a summary paper will be prepared,

K3: TRANSFORMER THERMAL OVERLOAD PROTECTION

Carlos Castro, Chair
S. Zocholl, Vice Chair
Established 1995
Expected Completion Date: 1998
Output: Committee report/Transactions paper
Draft 2

The WG met in a double session .to discuss comments on draft 2 of the complete document. The comments discussed included those from Linden Pierce who is reviewing the work in behalf

of the IEEE Transformer Committee. There were 24 members and 18 guests present. Bob Haas joined the WG.

K4: BUS PROTECTION GUIDE

S. P. Conrad, Chair

R.W. Haas, Vice Chair

Established, 1983

Output: Revision of Standard ANSI C37.97

Expected Completion Date: 1997

In view of the long delay in getting this standard published, the possibility of starting a new project to further update the standard before re-submitting it to the Standards Board was discussed. There will be a task force meeting at the May PSRC meeting to recommend whether efforts to get the approval from the Standards Board should continue, or whether a working group should be formed to further update the guide from the existing document. All members of the WG that helped with the last revision and all persons interested in the subject of bus protection are encouraged to attend the Task Force meeting. In the meantime, it was agreed at the Main PSRC meeting that Steve Conrad would contact Joe Koepfinger to try to see what could be done in the Standards Board to investigate problems in approval/publication of the last (successfully balloted) revision of the guide.

K5: NETWORK TRANSFORMER PROTECTION GUIDE

C. R. Sufana, Chair

J. J. Horwath, Vice Chair

Established, 1994

Output: Revision of Standard ANSI C37.108

Expected Completion Date: 1999

Draft 4

Comments received from the working group members on draft 4 were discussed. Various members discussed recent problems with customers who want to connect cogeneration to a network protector. Draft 5 will be available prior to the next meeting for all working group members to review. The Chair will contact Miriam Sanders regarding identification of the Balloting group.

K6: SHUNT CAPACITOR PROTECTION GUIDE

S. R. Chano, Chair

G. Fenner, Vice Chair

Established, 1994

Output: Revision of Standard ANSI C37.99

Expected Completion Date: 1999

Draft 1

The WG met in a double session to discuss the first completed draft of C37.99. The center of the discussion was devoted to the proposed sections and figures of the guide. The present objective is to issue draft 2 by March 15, 1998 and informally ballot the working group prior to the next meeting. Modification to the working group membership list as of the January meeting include Al Darlington as a new member, the resignation of Vern Dvorak due to retirement and the request from Carey Cook to stay on the membership list as a correspondent member. Eight members and nine guests attended at least one of the scheduled sessions.

K8: GUIDE FOR PROTECTIVE RELAYING OF UTILITY CONSUMER INTERFACE.**Irwin Hasenwinkle, Chair****Fred Griffin, Vice Chair****Expected Completion Date: 1998****Output: Revision of ANSI Standard C37.95****Draft 3**

The WG met to discuss the proposed draft. The next step will be to prepare draft 4 for WG to ballot. The balloting procedure is expected in the summer of 1998 and the Chair will contact Miriam Sanders regarding identification of a balloting group. Action items were made to include a section detailing Distribution & Transmission Line Relaying and resolve conflicts concerning the use of 27 and 59 relays for islanding vs ground fault detection. The number of this WG has been changed from I18 to K8.

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

The Chairman reported the nearly completed status of the Special Publication and the difficulties being encountered in editing the figures and preparing the final version. Most of the figures are in HPGL format, and the document is in Wordperfect 5.1. Irwin Hasenwinkle, Al Darlington and Mike McDonald volunteered to investigate what software tools might apply and whether they could assist by helping with the figure revision task. The remainder of the meeting was spent in reviewing Draft 1 of the summary paper with the objective of reducing its size to six pages including figures. Good progress was made and Jim Stevens volunteered to provide further written suggestions. The Chairman would like to have any further comments on the summary paper by March 31. There were 9 members and 6 guests in attendance at the meeting.

K13: SERIES CAPACITOR BANK PROTECTION**A.F. Elnewihi, Chair****F.P. Plumptre, Vice Chair****Established, 1993****Output: IEEE Special publication****Expected Completion Date: 1998****Summary Paper**

The Special Publication prepared by the WG has been published. During the meeting, plans for writing a summary paper were discussed. It is intended to prepare and comment on a draft of the summary paper before the next meeting. Six members and one guest attended the meeting.

KTF1: SOLID STATE CONVERTERS ACTING AS INTERFACE RELAYS**William Feero, Chair****Vice Chairman (Vacant)****Established, 1998****Expected Completion Date: 1999**

Output: Standard Through the SCC 21
Scope: To Be Determined

The following history of events leading to the decision to form this Task Force was reviewed. Briefly they were: 1) the issuance of UL1741 without giving the PSRC the opportunity to comment; 2) a request by Joe Koepfinger to have a SCC Committee develop a standard that would be applicable to all non-conventional generation technologies that will interface with the utility grid via solid state (power electronic) converters; 3) the decision by the IEEE to disband SCC23 which was originally chartered to deal with relay interface issues of non-utility owned generation; and 4) the concurrent proposed expansion of the scope of SCC21 (where the PSRC has very limited representation) to handle Joe Koepfinger's request.

The consensus of the group attending the Task Force meeting was that the PSRC must take an active role in any interface standard development. However, the whole impetus for developing a standard is to evolve a solid state (power electronic) device that can serve the dual function of a power control / conditioning device and interface relaying package. Therefore, it was agreed that a broader constituted group, such as a SCC, would have to take the lead in any standard development. The proposed resolution to this dilemma was the following. The PSRC will organize a Task Force to deal with the specific issues of interface relaying. The PSRC will request that SCC21 incorporate this Task Force in whole as a subset of any Working Group it may form. A letter effecting this step has been written for the PSRC Chair's signature.

Liaison Reports:

1. Transformer Committee, J.D. Huddleston III - No report.

2. Performance and Testing of HVDC Transmission Systems, P-1030.1, P-1030.2, and P-1030.3, R.E. Hart

Nothing to report. WG 15.05.06 is scheduled to meet on February 3,1998, during the PES Winter meeting in Tampa, Florida.

Coordination Reports:

1. ANSI/IEEE Switchgear Standards F Plumptre.

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

Draft 14a has been accepted by all interested parties and resubmitted to IEEE Standards Board for publication in 1997. Due to procedural problems and to reflect changes in C37.20.4, DRAFT 15a will be submitted to IEEE for a new ballot.

b) C37.100.1, Common Requirements for IEEE Power Switchgear Standards - Nothing to report.

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

Balloting of Draft 7 was in progress at the September Switchgear Committee meeting. The PSRC coordinators negative comments on this draft have been distributed to the WG..

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

Nothing to report.

4. PC62.91-SPD, Revision of IEEE 32 Requirements, Terminology, and Test Procedures for Neutral Grounding Devices, D.C. Dawson. Nothing to report.

5. C37.66 Requirements for Capacitor Switches for Ac Systems, S R Chano. No report.

6. P1375 Guide for the Protection of Large Stationary Battery Systems, T. E. Weidman
No report.

Old Business None.

New Business

The Chair asked all Substation Protection Subcommittee Members to confirm either by E-mail or by FAX their willingness to continue the good work done so far in Subcommittee. The main requirement of continued membership is active participation in Subcommittee activities, including regular attendance at meetings. The Chair asked all WG Chairs to be sure to send copies of all WG correspondence for information to the Subcommittee Chair and Vice Chair. He also suggested that if they send copies of all mature WG draft documents to the PSRC officers for information, this would facilitate approval of their documents by the officers when such approval was requested.

Vern Dvorak (a past chair of the Subcommittee) has resigned from the Subcommittee due to his inability to attend future meetings. The Subcommittee thanks him for all his past contributions to its work. Carey Cook has changed his status to corresponding member of the Subcommittee. Bill Feero was welcomed as a new member of the Subcommittee.