



POWER SYSTEM RELAYING COMMITTEE

OF THE

IEEE POWER ENGINEERING SOCIETY

MINUTES OF THE MEETING

January 12 – 15, 2009

Atlanta, GA

First Draft

**Power System Relaying Committee
Main Committee Meeting Agenda**

Jan. 15, 2009

Atlanta, GA

8:00 AM – 11:30 AM

- | | |
|--|-------------------------|
| I. Call to order / Introduction | Miriam Sanders |
| II. Approval of Minutes/Financial Report | Roger Hedding |
| III. Reports of Interest | Miriam Sanders |
| A. Technical Paper Coordinator's Report/Future Meetings | Bob Pettigrew |
| B. PES Report- points of interest | Wanda Reeder |
| C. CIGRE Report | Mark Adamiak |
| D. UCA Report | John Burger |
| E. EPRI Report | John Hughes |
| F. IAS Power System Protection Committee | Chuck Mozina |
| G. IEC Report | Eric Udren |
| H. Standard Coordinator's Report | Jeff Gilbert |
| I. Substation Committee Report | Craig Pruess |
| J. NERC Report | Bob Cummings |
| K. Other Reports of Interest | |
| IV. Advisory Committee Reports | Miriam Sanders |
| B1. Awards/ Recognition | Bob Beresh |
| V. Subcommittee Reports | Miriam Sanders |
| C- System Protection | Rich Hunt |
| I - Relaying Practices | Tarlochan Sidhu |
| K - Substation Protection | Frank Plumptre |
| H - Relaying Communications | Veselin Skendzik |
| D - Line Protection | Mike McDonald |
| J - Rotating Machinery | Kevin Stephan |
| VI. Presentations | Roger Hedding |
| VII. Adjourn | Miriam Sanders |

I. Call to order / Introductions Sanders

Chairman Charlie Henville called the meeting to order at 8:05 am.

II. Approval of Minutes (January Meeting) & Financial Report Hedding

The minutes of the Vancouver (Sept. 2008) meeting were approved. The Vancouver meeting again was slightly profitable a continuing trend. The Atlanta meeting, since it was a joint meeting organized by PES, will have no financial impact on PSRC.

III Chairman's Report Sanders

Alex Apostolov was elected as a 2008 Fellow for contributions to the use of digital computers for power system protection, control and operation. This is the highest grade of membership bestowed upon our members. One in one thousand is elected to such a high honor. Congratulations Alex!

We welcome ten new Main Committee Members:

George Bartok

Matt Basler

Shinici Iman

Steve Kunsman

Raluca Lascu

Pierre Martin

Mani Venkata

Roger Whittaker

Alla Deronja

Bill Dickerson

This is the first of my first "official" meeting as chair, although I have already led a Main Committee meeting in the past. This meeting is a record for our attendance. January's meeting always sees a larger group than the other two, with our record to this point being Tampa 6 years ago with 221 attendees, but we had other groups with us – such as the Power Systems Communications and Substation committee. With this meeting, we had 242 PSRC designated attendees. This is the second time we have met with other technical committee at the Joint Technical Committee Meeting. There were two other large committees, and several small ones. This illustrates just how successful the PSRC organization is. The PSRC is such a well run organization, thank in large part to the past officers of the committee. Thank you to all of you. Your leadership will carry me through the next two years and for that I am truly grateful. Being a member of the PSRC is an intangible asset, the close relationship that we have in the relay community is invaluable, and the leadership of the past offices is priceless.

All main committee members were asked to stand and were counted. Of the 124 Main Committee members, 82 were present, meeting a quorum.

Reports of Interest

A. Technical Paper Coordinator's Report – Sept. 2008 Pettigrew

The IEEE PES 2009 Power Systems Conference and Exposition will be held in Seattle, WA March 16-18, 2009. There were 21 papers submitted for presentation. At this conference, there will only a poster session for the papers.

The IEEE PES 2009 General Meeting is in Calgary July 26-30, 2009. The paper review process is on-going. We have 66 papers submitted at present time. There are also 2 transaction papers submitted for presentation. Revise and Resubmit decisions are due to the authors by Jan 25, 2009 so please submit your comments as soon as possible. If anyone is going to this meeting and would like to be a session chair, please let me know.

B PES Report

Wanda Reeder

No Report submitted.

C. CIGRE B5 Activities Report

Adamiak

D. UCA Report

Burger

No Report

E. EPRI Report

Hughes

No Report.

F. IAS Power System Protection Committee

Mozina

The following are items of interest to the PSRC:

- **Color Book Reorganization Progress** – The IAS 2008 General Meeting was held on Oct. 5-9 in Edmonton, AB. where one of the major undertakings was the updating and reorganization of the color book series. The major item of interest for the PSRC is the Buff Book (Protection and Coordination of Industrial and Commercial Power Systems), which will be combined with the Blue Book (Low Voltage Protection Systems) into a single set of stand allow IEEE standards. The goal is to break out the chapters, which address protection of individual areas (transformers, generator, cables, est.) so the IEEE could sell them separately. Each individual charter will be assigned a PAR and will be a “stand allow” standards document.
- **Generator Grounding and Ground Fault Protection WG** – This WG is investigation potential transient overvoltages associated with hybrid generator grounding. The WG has completed extensive EMPT studies to define the switching surges created by switching the low resistance ground source at the neutral of the generator. Surge protection has also been defined by the WG. A WG paper that addresses these issues was presented at the May 2008 IAS I&CPS conference and has been submitted for republication in IAS transactions. WG members presented a half-day tutorial on hybrid generator grounding at PCIC (Petroleum and Chemical Industry Conference) which was held in Cincinnati on Sept 21-25.

G. IEC Report

Udren

TC 95, Measuring relays

Typically this report lists TC 95 standards drafts, requiring assessment and vote from the US National Committee (USNC) Technical Advisory Group (TAG) that meets as WG I4. In this cycle, however, the WG got a break – IEC circulated no new standards documents.

Murty Yalla is Convenor of Maintenance Team (MT) 4 of TC 95, developing new IEC relay functional standards. His team met in conjunction with the IEC General Meeting and TC 95 meeting in Sao Paulo, Brazil in November. He reported on progress of functional standards projects in MT4:

- 60255-151 –Functional standard for over/under current protection – excellent draft is nearly ready for final draft international standard (FDIS).
- 60255-127 - Functional standard for over/under voltage protection - a single curve implementation similar to -151, making progress and needing more work.

- 60255-121 – Functional standard for distance protection – in early phase of development, and needs a lot of work to achieve formal CD.
- 60255-149 – Functional standard for thermal relays – not yet begun – update 60255-8.
- 60255-187-1,2, etc. family of standards - Functional standard for differential protection – bus, transformer, line, etc. – not yet begun, and needs more definition.

Jodi Haasz of IEEE Standards described an accord she developed with IEC after a long deliberation process. We have a path to achieve international standard status for IEEE C37.94 on optical fiber communications to multiplexers, and C37.118 Synchrophasor standard. There will be joint development projects in which IEC groups can comment on drafts. With this, IEC is enthusiastic about participation.

TC 95 (the IEC Technical Committee on relays) would like to meet at the IEC General Meeting in Seattle in 2010 and asked for US National Committee support. According to USNC, we must raise \$18,000 to host this meeting, from supportive vendors and utilities. The Technical Advisor and Murty Yalla are asking vendors for pledges, some needed in the next couple of weeks to position the meeting in the USNC plans. Volunteered pledges of \$1000 to \$4000 help and payment is not needed until 2010. Donors will have name and logo posting as supporters at this large international meeting. It is important for the US to meet this need. Please contact Eric Udren at once if you think you can help.

TC 57, Power systems management and associated information exchange

Protection and control system designs are increasingly based on data communications systems and processing standardized by TC 57. Christoph Brunner, Convenor, reports the following. See SC H liaison reports for more detail.

TC 57 WGs report activity on the following topics:

- Preparation of Edition 2 – the major revision of IEC 61850.
- A new IEC 61850-7-500 will describe modelling of substation automation systems.
- Technical specification IEC 61850-80-1 maps IEC 61850 on IEC 60870-5 (international cousin of DNP3) for gateway design.
- Technical report IEC 61850-90-1 will describe the use of IEC 61850 for communication between substations
- Technical report on network engineering guidelines.
- Publication of 61850 object models from all domains as a web based standard.
- A new task force will be created on condition monitoring with IEC 61850.
- Draft standard for 61850-7-420: object models for distributed energy resources.
- Development of 61850-7-510: logical nodes to model applications for the control of hydro power plants.
- Harmonization of IEC 61850 and CIM standards IEC 61968 / 61970.
- Development of IEC 62351-7, objects for network management and system security
- Development of IEC 62351-8, role based access control for power system management.

H. Standard Coordinators Report

Gilbert

Standard Coordinators Report January 13, 2009

The Standards Coordinator, Jeffrey Gilbert, met with the Chairs of the Working Groups writing and revising standards documents at a session beginning at 8:00 AM on January 13, 2009, in the Capital North room of the Sheraton Atlanta Hotel. Prior to reviewing the status of standards development activities, the session was started by Mal Swanson presenting information on the IEEE definitions database.

Important Information

All working group chairs should be aware that IEEE has developed a definitions database. Working group chairs developing a Standard, Guide or Recommended Practice should be aware they:

- may gain free access to the Database by emailing a request for a password to Matt Ceglia at m.j.ceglio@ieee.org
- should include a “Definitions” clause in the document that they are developing
- may define non-protective terms in this clause
- may define terms already defined in the database in this clause

Information concerning the Standards Association (SA), Board of Governors, Committees of SA, and development of standards, recommended practices and guides and related issues is available on the following web site.

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

Remember to review the IEEE Patent Slides for use at all Standards Development meetings. The slides are available at:

PPT version:

<http://standards.ieee.org/board/pat/pat-slideset.ppt>

PDF version:

<http://standards.ieee.org/board/pat/pat-slideset.pdf>

The Standards Coordinator will fill out the L50-S forms required by IEEE for all PSRC working groups.

Standards Activities Since The September, 2008 Meeting

The status of the standards activities, which have taken place since the September, 2008, meeting of the PSRC, are as follows.

1. Standards Published

None

2. Standards waiting to be Published

None

3. Standards Reaffirmed

None

4. Standards submitted for reaffirmation

None

5. Standards approved

None

6. Standards submitted for approval

None

7. Standards to be submitted for approval

None

8. Submitted for Balloting/ Recirculation

None

9. Standards Balloted

C37.106 Guide for Abnormal Frequency Protection for Power Generating Plants

10. Standards Re-circulated

None

11. Standards to be Re-circulated

PC37.105 IEEE Standard for Qualifying Class 1E Protective Relays and Auxiliaries for Nuclear Power Generating Stations

12. Standards due for 5 year review /to be submitted for Re-affirmation

C37.93 Guide for Power System Protective Relay Applications of Audio Tones over Telephone Channels

C37.103 Guide for Differential and Polarizing Relay Circuit Testing

C37.106 Guide for Abnormal Frequency Protection for Power Generating Plants

C37.114 Guide for Determining Fault Location on AC Transmission and Distribution Lines

C37.115 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

13. Standards withdrawn

None

14. New PARs applied for

PC37.110/Cor 1 IEEE Guide for the Application of Current Transformers Used for Protective Relaying Purposes - Corrigendum 1:Corrections to Equation 18 and Equation 19

PC37.239 Standard Common Format for Event Data Exchange (COMFEDE) for Power Systems

15. New PARs approved

PC37.110/Cor 1 IEEE Guide for the Application of Current Transformers Used for Protective Relaying Purposes - Corrigendum 1:Corrections to Equation 18 and Equation 19

PC37.238 IEEE 1588 Profile for Protection Applications

PC37.239 Standard Common Format for Event Data Exchange (COMFEDE) for Power Systems

16. PAR Extensions applied for

None

17. PAR Extensions approved

None

18. Modified PAR approved

None

19. Modified PAR Submitted

None

20. PARs Withdrawn

None

21. PARs expiring at the end of 2009

PC37.105 IEEE Standard for Qualifying Class 1E Protective Relays and Auxiliaries for Nuclear Power Generating Stations

PC37.111 Standard Common Format for Transient Data Exchange (COMTRADE) for Power Systems

PC37.233 Guide For Power System Protection Testing

PC37.234 Guide for Protective Relay Applications to Power System Buses

SUBMITTAL DEADLINES & STANDARDS BOARD MEETING SCHEDULE

PAR/Standard Submittal Deadline Standards Board Meeting

February 6, 2009 February 24, 2009

May 10, 2009 June 12, 2009

July 31, 2009 September 9, 2009

October 19, 2009 December 4, 2009

J. NERC Report

Cummings

No Report

IV. B. ADVISORY COMMITTEE REPORTS

Sanders

Chair: Miriam Sanders
Vice Chair: Bob Pettigrew

B1: Awards and Technical Paper Recognition

Chair: Bob Beresh
Vice Chair: Solveig Ward

The group met on Tuesday January 13, 2009.

Mal Swanson brought us up-to-date on the latest service awards.

The members were brought up-to-date on the J5 PES award certificates. These were given out at this General Meeting.

The “career service award” was discussed as to who might be a recipient for 2009.

The PES automatically generated the “distinguished service award” for outgoing chair Charlie Henville and this was presented at the General Meeting.

Oscar Bolado has expressed interest in becoming the chair of B1 on a longer term basis in order to provide better consistency to this role. This was discussed at the ADCOM meeting and it was decided that Oscar would hold the position of chair for 4 years, beginning in 2010, after which time he could serve again, or a new chair could be selected. Bob Beresh will continue as chair of B1 for the remainder of his term (2009) while helping Oscar to learn the role. Solveig will fulfill her remaining term as vice-chair of B1 until she becomes chair of her subcommittee. The position of vice-chair of the B1 subcommittee will continue to be rotated through various subcommittee vice-chairs on a two year rotation basis, as is the current practice.

B2: Fellows Awards

Chair: J.S. Thorp

No Report

B3: Membership Committee

Chair: M.J. Swanson

Attendance during the PSRC meeting was approximately 242. This breaks our attendance record.

27 new attendees were in our Newcomers Orientation meeting on Tuesday, which also breaks our attendance record. This is the first participation by Bob Pettigrew.

No management support letters were written.

No new Service Awards were created, as a large number of awards were given during the Main Committee Meeting.

B4: O & P Manual and WG Training

Chair: J Appleyard O&P Manual
Chair: R Hunt WG Training

No working group chair training session was held.

B5: Bibliography and Publicity

Chair: T.S. Sidhu

Vice Chair: M. Nagpal

The WG met on Jan 13, 2009 with six members in attendance. The Chair indicated that the 2007 bibliography paper is ready and will be submitted for publication in the IEEE Trans. on Power Delivery. Assignments for preparing the 2008 bibliography paper were made. Mal Swanson will work with the PSRC Chairman to assist in preparation of the publicity report. There have been no NERC reports to review for the last five years and the WG agreed to remove this from the agenda for future meetings. Progress regarding possible creation of a searchable bibliography database will be checked by the Chair with Alex Apostolov.

B8: Long Range Planning

Chair: Charlie Henville

B9: PSRC Web Site

Chair: Russ Patterson

Working Group B9 did not meet.

V. SUBCOMMITTEE REPORTS

C: SYSTEM PROTECTION SUBCOMMITTEE

Chair: R. Hunt

Vice-Chair: S. Ward

The C System Protection Subcommittee met on Wednesday, January 14, 2009, in Atlanta with 19 members and 27 guests in attendance. Quorum was reached.

9 Working Groups met at this meeting. The members of the Subcommittee approved the minutes of the September 2008 meeting.

A discussion regarding IEEE Transaction Papers versus conference papers was held. This subject came up for Working Group C4 but is also valid for Working Group C12. The issue is that an IEEE Transaction Paper has to have unique and original content and conference papers cannot be published ahead of the Transaction Paper. While presentation of subcommittee reports at relay conferences is of large value, the general consensus was that Transaction Papers should take priority.

For C12, Performance of Relays During Stressed System Conditions, this has been solved by either submitting only power point presentation copies to the conference (Mypicon) or a short summary of the report (Texas A&M).

For C4, Global Industry Experience with System Integrity Protection Schemes, it was decided to write the Transaction Paper first, and submit to relay conferences at a later date.

New members: The Subcommittee welcomes new member Benton Vandiver.

PSCE liaison report: nothing to report.

PSSC liaison report: Nothing to report.

Reports from the WG Chairs

C4: Global Industry Experience with System Integrity Protection Schemes (SIPS)

Chair: Vahid Madani

Vice Chair: Miroslav Begovic

Output: Survey

Established: September 2004

Expected Completion Date for the Survey: September 2008

WG C-4 met on January 13 in one session with total of 20 in attendance (14 Members, 6 Guests). Two guests have volunteered to become members and provide specific international contributions of experiences and schemes.

The WG members reviewed the summary of the responses received so far. The discussions included the spreadsheet tabulation of responses and the detailed report. The table of content of the nearly completed report was discussed to determine completeness of the report.

The latest version of the detailed report is posted on the PSRC Working Group web site. The WG members are asked to review the detailed report to determine whether the right kind of information is currently in the report, and which, if any, new information should be updated or added. The survey, which contains the names of the individual companies, is not posted on the site, but has been circulated among the WG members.

Vahid briefly mentioned contributions by Damir Novosel, Mark Adamiak, Victor Ortiz Muro, Frankie Au-Yeung, Shinichi Imai, Miroslav Begovic, Rich Young, George Bartok, Stan Horowitz, Jon Sykes, Giorgio Giannuzzi, and Vahid Madani.

Vahid also mentioned reviewers of the draft detailed report including:

Mark Adamiak, John Fitch, Daniel Karlsson, Damir Novosel, Walter Sattinger, Eric Udren, and Vahid Madani.

The detailed report has a section discussing "Missing Responses" – participation was sought world-wide, but not received from everywhere. In some cases, several attempts have been made to solicit responses. Certain organizations have elected not to participate (China, Russia, or Germany for example), in others it may have been the lack of enthusiasm that caused the ultimate lack of the responses. Eric Udren had raised whether such a section is needed. The WG members discussed the topic. Eric elaborated that the survey results are very comprehensive and that participation rate is very high. Hence, it is clear that attempts have been made and the volume of responses is clear. Charlie Henville suggested to look at the report and determine whether specific countries are named as part of survey analysis. If the survey results are analyzed without any references to countries or specific power companies, we can remove the section.

The WG members and attendees also reviewed the results of the survey, and the analysis descriptions summarized by the WG members. There are 935 schemes reported so far from over 100 respondents as of December 2008. One section in the report focuses on the number of responses, as being more indicative of the informational content, as opposed to the number of responses. The section on SIPS Classification shows a relatively even distribution of the schemes by type. About 63 percent of the reported schemes have been developed for security. At Stan Horowitz's suggestion at the September 2008 meeting, the responses have been grouped based on types of actions. A table of 7 major categories of schemes have been developed and responses have been tabulated into the 7 categories.

- Load Shedding
- System Stability
- Controls - High Speed Reactive Voltage
- Generation Control - Slow Speed
- Controls - Slow Speed
- Congestion Mitigation
- Other

Many of the schemes address abnormal situations of the multiple contingency type. More member input is solicited in further dissecting the available data. Tables 6a and 6b outline some of the functional breakdowns of the schemes. Functional performance part of the report was presented next. Interesting information is that about 47 percent of the schemes have never operated. This also emphasizes the importance of testing to ascertain the validity of the schemes. In discussion on examples, some suggestions were made. Vladimir will add to the report a text on adaptive schemes.

In the application examples section, several WG members have provided examples from different parts of the world including North America, Europe, South East Asia.

The detailed report is posted on WG C-4 web site and members are asked to review the complete analysis of the survey results and provide any additional comments by mid February 2009. Some of much smaller, but more detailed CIGRE survey from 2003 will also be captured and briefly presented in the report.

Additional work in finalizing the report is due by mid February and a final report will be submitted to the C Subcommittee sometime in mid March for review and approval.

The WG members discussed writing the summary report which is the next step after the final report. The assignment includes writing a Transactions paper also. Vahid asked the WG member to think how we want to summarize / capture the examples covered in the detailed report.

Work on the summary report will start with an outline. Charlie Henville suggests that the detailed report be first completed and reviewed by the SC, then afterwards reduced into an abbreviated form.

Vahid solicits the names of Transaction paper contributors.

Mark Adamiak, Vahid Madani (Lead), Alex Apostolov, Damir Novosel, George Bartok, Tevik Sezi, Miroslav Begovic, Eric Udren, Stan Horowitz, John Fitch

Next Meeting – 30 People, 1 Session, Projector, Power strip

Assignment - Conduct a survey of power systems professionals worldwide to accumulate experience with SIPS. This survey will complement and expand upon the previously published IEEE/CIGRE paper "Industry Experience with Special Protection Schemes" by P.M. Anderson and B.K. LeReverend (IEEE Transaction on Power Systems, Vol. II, No. 3, August 1996). The survey will be conducted via an internet-based questionnaire with the assistance of, and be available to, other interested parties; (e.g. IEEE, CIGRE, PES, EPRI, etc.). The survey should be concluded by September 2008 and will be presented in a report to the "C" Subcommittee and a Summary Transactions paper.

C9: Appl. of Prot. Relays used for Abnormal Freq. Load Shed. & Restoration

Chair: A. Apostolov

Vice-Chair: K. Behrendt

The working group met on Wednesday, January 13th, with 6 members and 1 guest present. Chairman Alex Apostolov produced a draft summary paper for circulation to the working group. The working group was instructed to review and provide comments to Alex by April 15th so the summary paper can be finalized at the May meeting.

Alex will get a determination from PSRC officers on the need to include a list of working group members in the summary paper. M. Begovic volunteered to submit a paragraph summarizing the Bibliography.

The working group expects to meet in single session at the next PSRC meeting, and needs a room for 25 with a projector, projector screen and outlet strip.

C11: Guide for Protection System Testing

Chair: Vahid Madani

Vice Chair: Hyder DoCarmo

Output: Guide

Established: May 2005

Expected Completion Date – Balloting Body: August 2008

PAR Approved through: December 2009

WG C-11 met on January 13 in a single session with total 38 in attendance (19 M, 19 G). Quorum was established – More than 50% WG members present (total 34 members).

This Guide is under PAR – C 37.233

Balloting body has been established with 144 balloting body members.

Draft is posted and voting is in progress.

Comment period is open through January 23, 2009

After review of the patent slides, the WG members reviewed status of the open ballot period, and comments received from the balloting group. At this time, the draft guide has received 19 comments and all comments have been accepted and addressed by the WG members.

WG members discussed edited sections (by Hyder and Vahid) based on the balloting body reviewer's suggestions. As a result of one of the comments, a small section on transformer protection has been updated and the updated section reviewed by the WG members. Another comment received from reviewers is about documentation for written test procedures and the test results. This topic is covered in the present draft, but it is not as clear to stand out. Alex Apostolov and Jon Sykes will write a paragraph emphasizing the importance of having written test procedures.

Another comment received is to verify "Customer Special Required Tests". These tests are often following utility system structure.

Eric Udren has also been a liaison with NERC Standard group (PSMSDT) and presented the definitions for the terminologies that NERC is planning to introduce related to maintenance on protection systems. In particular, TBM (Time based maintenance), PBM (Performance based maintenance), and CBM (Condition based maintenance). Eric suggested that sections 1 and 2 of the Guide to incorporate the specific text reflecting the coordination of the efforts between PSMSDT and PSRC. The WG members agree with the terminology usage to be consistent and think the additional information is complement to the information already included in the draft Guide and will not substantially impact the Guide. Eric is the lead contributor to section 1 of the draft Guide and will submit his comments and NERC PSMSDT comments during balloting period.

We need support from the C subcommittee members that are part of the balloting body and have not voted to complete their review and comments and submit before the January 23 closing date.

Once balloting period is closed and comments are incorporated, we will coordinate with IEEE for the next steps.

Next Meeting – 30 People, 1 Session, Projector, Power strip

Scope, Purpose, and Reason:

This guide is intended for power system protection professionals. It will include a reference listing of type tests for protective devices as well as overall protection scheme performance tests for various types of protection schemes. The Guide will describe the methods, extent, and types of protection scheme tests. Interlocking and control functions inherent to the protective schemes are included. This assignment encompasses overall system testing procedures, data collection requirements, as well as the test procedure definitions.

Reason:

This document will aid academic, manufacturing, application engineers and industry protection professionals with the overall benefits for protection scheme performance testing. The document will discuss benefits and challenges associated with verification of overall protection performance and will include information such as: a) Listing of type / production tests, b) Product performance tests from user view, c) Commissioning test - d) Relay settings are properly selected and calibrated e) Verify connections and calibration of settings, f) Trip/no trip and troubleshooting test.

C12: Performance of Relaying During Wide-Area Stressed System Conditions

Chair: Damir Novosel

Vice Chair: George Bartok

Output: Working Group Report and IEEE Summary Paper

Established: 2004

Expected Completion Date: 2008

The working group report has been completed and published on PSRC's website. The working group did not meet in January, except for an informal meeting of the group preparing the IEEE transaction paper.

The working group will be dissolved in May and does not plan to meet.

C13: Undervoltage Load Shedding

Chair: M. Begovic

Vice-Chair: S. Imai

Output: IEEE Report

Established: September 2005

Expected Completion Date: January 2009

The meeting was attended by 10 members. Shinichi Imai briefly provided the overview of somewhat extensive additions and reformatting of the report which was taking place since the September meeting of the WG.

New contributions have been solicited from Thierry Van Cutsem and Costas Vournas, whose work in the area of voltage stability ties nicely to the objectives of the report.

Vahid Madani contributed to the topics of voltage recovery, time scales of voltage collapse, description of the WSCC event in 1996 and safety net.

John Burger contributed to the description of the distributed scheme in the report.

Shinichi contributed a brief account of Van Cutsem's paper on local identifier of long term voltage collapse from a recently published (Aug. 2008) Transaction paper.

Action items:

- Charlie Henville will provide reference list for his earlier contribution. Young will also provide references.
- Vahid Madani will send the text about maintenance and testing of UVLS schemes.
- Thierry Van Cutsem and Costas Vournas will provide contributions on local indicators.
- References, which are now placed at the end of the subsections, will be moved in the back matter of the report (and the text reformatted appropriately).

It was decided that the new contributions be done and integrated into the report by the end of February, upon which the group of assigned proofreaders will thoroughly review the report for 6 weeks. From mid-April, the first draft of the completed and proof-read report should be available for reviews prior to the May meeting in Pittsburgh. At that time, the group is planning a discussion on the report and assignments to be done on a summary Transactions paper, which is also part of the Group's assignment.

Working Group is planning a meeting in a single session in May 2009. Room will be needed for 20 attendees and a video projector.

Assignment: This working group produces a report on the implementation of undervoltage load shedding (UVLS) in electric power systems. It presents background information, guidance in implementing UVLS schemes and a bibliography. Voltage instability, voltage and reactive power management, emergency actions to avoid load shedding, UVLS philosophy and methods, voltage collapse detection, existing practices, settings and coordination between UVLS and UFLS are discussed.

C14: Use of Time Synchronized Measurements in Protective Relaying Applications

Chair: Jim O'Brien
Vice Chair: Alla Deronja
Output: IEEE Report
Established: May 2007
Expected Completion Date: December 2009

Assignment:

Produce a general report to PSRC Subcommittee C outlining practical protection applications using synchrophasors.

Scope:

Develop a report that identifies synchrophasor data and parameters that are useful for improving protection schemes and analyzing protective relay performance. The report will not include deployment of devices to acquire time synchronized measurements.

Working group C14 met on January 13, 2009, in Atlanta, GA, in a single session chaired by Jim O'Brien with 11 members and 24 guests. 1 member decided to become a guest and 1 guest joined the working group as a member.

Veselin Skendzic made a presentation "Real Life Synchrophasor Applications", which was well received and generated many questions. Among various possible synchrophasor applications, in his presentation, Veselin mentioned verification of phasor information for commissioning, current differential protection communication channel troubleshooting, testing for system stability with a generator unit out of service, and bus differential protection based on synchronized phasor measurements. These applications will be considered for inclusion in the current report. The presentation will be posted on the WG website shortly.

The chair distributed the latest draft of the proposed Outline, which was discussed by the group.

It was suggested to move ahead with the proposed Outline although a few additional topics were brought up and added to it.

Several writing assignments were distributed. The chair asked for an April 15th due date for the assignments. Please email the assignments to jmobrien@duke-energy.com.

Due to the slower than expected progress with the report, the original report completion date was proposed to be moved to the end of the next year.

Requirements for the next meeting are as follows: single session, meeting room for 40 people with a computer projector.

C15: Design and Testing of selected SIPS

Chair: J. Sykes
Vice-Chair: Y. Hu
Output: Report
Established: September 2008
Expected Completion Date: December 2012

Working group C-15 held a meeting on Tuesday, January 13, 2009 in single session with a total of 20 people in attendance (10 members and 10 guests). 1st Session was cancelled and only the 2nd session was held. The working group opened this meeting with a review of its background and the meeting minutes of the September 2008 meeting. The working group focused the discussion on defining the Outline of the report. There was considerable discussion of various sections and content. Action Items were identified and assigned. The WG plans to access information from C4 and C11 work groups, other IEEE transactions and interviews with members of various regions.

The WG requests the C subcommittee to verify the name change of this WG to include the word "selected" in the title.

Several new sections will be needed:

Definition Section, Discussion of Reliability of selected schemes and its impact to the reliability of the protected electric system, a generic model in describing SIPS (Measurement, Arming, Alarming, Processing/Logic, Mitigation/Action, Communications and Performances, etc.), Testing of Failure modes (i.e. failure in voting schemes)

Various Writing Assignment and Action Items:

- Include suggested changes to the Outline and redistribute to members – Yi Hu
- Provide a generic discussion of the Measurement/Communication/Processing/Mitigation of SIPS – Mark Adamiak
- Provide a discussion about communications used in SIPS – Jim Ebrecht
- Provide an example of a generation rejection scheme – Shinichi Imai
- Provide a discussion about testing of SIPS including testing for failed components – Tevfik Sezi

The working group will meet at next PSRC meeting in one session to continue development of the outline and review of assignments.

C16: Relay Scheme Design for Modern Relays

Chair: K. Birt

Vice-Chair: R. Lascu

Output: IEEE report

Established: May 2008

Expected Completion Date: 2010

Assignment: Write a supplement to the existing 1999 relay trip circuit design paper as an IEEE report to address microprocessor relays.

- Exclude: AC voltage and current inputs
 - Goose
 - Internals of relays
 - IRIG and communication issues
- Include: signaling between protective elements such as relays, breakers, etc. primarily as it applies to trip and control circuits

Working Group C16 held its meeting on Wednesday morning with 12 attendees. Only one working group member was in attendance. With the chair and vice-chair absent, the meeting was chaired by Tony Seegers with the assistance of subcommittee chair Rich Hunt.

Alla Deronja, Josh Warner, Bill Strang, Robert Frye, and Tony Seegers have been added as members of the group.

The working group outline was discussed. Rich Hunt agreed to incorporate suggested changes to the outline which will be distributed to the members for review.

Writing assignments will be issued at the next meeting in May. Also at the May meeting presentations will be given by Robert Frye from TVA on DC circuit protection and by Don Sevcik from Central Point Electric on lessons learned in control circuit design.

Next meeting requirements: Single meeting, 30 persons, computer projector.

Request that the meeting does not conflict with the I5 working group whose assignment is complementary to this working group.

Assignment: Write a supplement to the existing 1999 relay trip circuit design paper as an IEEE report to address microprocessor relays.

- Exclude: AC voltage and current inputs
 - Goose

- Internals of relays
- IRIG and communication issues
- Include: signaling between protective elements such as relays, breakers, etc. primarily as it applies to trip and control circuits

CTF17: Fault Current Contribution From Wind Plants

Chair: D. Miller

Vice-Chair: G. Henneberg

Output: Report by the Joint Working Group

Established: September 2008

Expected Completion Date: 2010

The working group met in a joint session in Atlanta. A presentation on fault current contribution was given by an engineer from a wind turbine generator manufacturer.

Assignment: "To characterize and quantify short circuit current contributions to faults from wind plants for the purposes of protective relaying and equipment rating, and to develop modeling and calculation guidelines for the same." The assignment for the System Protection Subcommittee Working Group will be: To support the activities of the Joint Working Group on Fault Current Contributions from Wind Plants in the production of a report that characterizes and quantifies the short circuit current contributions to faults from wind plants for the purposes of determining protective relay settings and fault interrupting equipment ratings. The report will provide guidelines on the modeling and calculations for that purpose.

The scheduled meetings for the Joint Working Group are planned to be at the following times:

- PES Joint Technical Committee Meeting in January
- PSRC group only in May (to address specific relay issues to be brought up in the joint discussions)
- PES General Meeting in July
- PSRC meeting in September

The Working Group will meet in May with PSRC members only in a single session. We will need a room for 30 people with a computer projector.

D: LINE PROTECTION SUBCOMMITTEE

Chair: M.J. McDonald

Vice Chair: Russ Patterson

The meeting was called to order at 3:00 PM on January 14, 2009.

After introductions, a quorum was verified with 25 members and 21 guests present.

The September 2008 meeting minutes were approved without comment.

All attendees were encouraged to attend a presentation by the NERC System Protection and Control Subcommittee members on Wednesday evening. The presentation covered the SPCS paper on relaying redundancy/reliability which is the basis for a proposed NERC Standard.

The chair also announced that beginning in the September meeting that the SC meetings would be on Thursday morning followed by the Main Committee meeting Thursday afternoon. This change allows for greater flexibility in meeting scheduling.

The Chair noted that the effort to get the IEEE Fault Locating Guide re-affirmed is now underway and SA members should be watching for the opportunity to join the balloting pool.

General items during the meeting:

1. DTF6 on Transmission Line Model Parameter Verification requested approval to form a working group- this was approved and will convene in May.
2. DTF3 on Polarizing agreed to meet again in May to finalize a WG proposal.
3. DTF25 on Distance Measurement Performance with Non-sinusoidal Inputs also agreed to meet in May to finalize a WG proposal.
4. Fred Friend announced that the Cold Load Pick-up paper will be presented at the Texas A&M Relay Conference
5. Gary Kobet announced that the D8 working group report on Justification for Pilot Protection will be presented at the GA Tech relay Conference. Alex Apostolov noted this type of information can also be published in PAC WORLD.
6. Tony Seegers suggested that negative sequence relaying may be a topic for a future working group. This will be followed up on at later meetings.

Reports from the WG Chairs:

D2: Revision of C37.104-2002 IEEE Guide for Automatic Reclosing of Line Circuit Breakers for AC Distribution and Transmission Lines

Chair: Gary Kobet

Vice Chair:

Output: IEEE Guide

Established: September 2008

Expected completion date: Undetermined

Working Group D2 held its initial meeting on Tuesday morning with 17 attendees. Eleven of the attendees volunteered to become members of the working group. The IEEE patent requirement slides were presented, and attendees were given the opportunity to identify any known patent claims.

The working group assignment was discussed. Mike McDonald suggested the wording be slightly modified to include the original approval or reaffirmation date of the guide (using the WG D9 assignment as an example).

The vice chairman noted that a PAR for this working group will be submitted in early January 2009. In preparation of this request, the working group reviewed the scope of the existing guide and deemed it adequate for the PAR after deletion the word "current" in the first sentence.

The working group reviewed the table of contents/outline of the existing guide. Working Group members volunteered to review existing clauses and provide feedback to the chairman by November 30th. Working group members also provided additional topics that they felt should be covered in the guide. These were added to the outline.

Joe Perez was not able to find a corresponding document on the IEC website. He will talk with Eric Udren to verify an IEC reclosing document does not exist.

Pratap Mysore indicated that regional entities have begun to gather information on member utility automatic reclosing practices. Working group members were requested to provide this information as available to the chairman for possible inclusion in the guide.

Next meeting requirements: Single meeting, 20 persons, computer projector.

D4: Application of Overreaching Distance Relays

Chair: Russell W. Patterson

Vice Chair: Walter P. McCannon

Output: Working group report to PSRC.

Established: May 2004

Expected completion date: January 09

In the absence of the Chair the Vice Chair handed out copies of the latest draft and held a short discussion. The revised draft will be voted on by the WG members prior to the May meeting. If accepted, the report will be sent to the SC for comment, prior to submittal to the Officers for final approval.

No meeting is planned for May.

D9: Revision of C37.113 – IEEE Guide for Protective Relay Applications to Transmission Lines

Chair: Mohindar Sachdev

Vice Chair: Simon Chano

Output: Revised IEEE Guide C37.113

Expected completion date: 2009

Draft 2

The WG met at 4:30 PM on January 13, 2009 in Atlanta, GA; Eighteen members and seven guests were present.

The patent slides could not be shown due to incompatibility between the softwares of the computer projector and the notebook. The WG chair summarized the patent issues from the slides.

The Chair reported that three outstanding contributions were received after the September 2008 meeting and were incorporated in Draft 3. Two contributions are outstanding; one contribution is expected to be received next week and the other is expected to be received in four weeks time. Draft will be completed and will be distributed before the next meeting of the Working Group and balloting of the draft will start soon after the WG meeting in May 2009.

Next meeting: WG will meet in one session for 45 persons with a computer projector.

D11: Effect of Distribution Automation on Protective Relaying

Chair: Fred Friend

Vice Chair: Jerry Johnson

Output: Report to the PSRC

Established: January 2005

Expected Completion Date: January 2010

The working group, chaired by Fred Friend, met on Tuesday afternoon with 11 members and 20 guests present. The WG membership is now 21 with the addition of one new member, Cheong Siew.

Minutes from the Vancouver meeting were reviewed and approved after a minor change. The WG reviewed clauses 1.0, 2.0, 6.2, and 6.3 and continued formulating the format and content. The working group re-affirmed the objective to report on the effect of DA on protective relaying and not to describe every DA scenario. We concluded it would be best to keep the referenced DA methods as generic as possible but still informative relative to the impact on relaying. The WG continues work on establishing a team to generate a group of generic DA one-line figures and build on those.

The WG is currently working on Draft 2.2 of the report. Don Parker will incorporate the discussed changes into clause 6.2, and clause 6.3 needs to incorporate the focus on the effect on relaying. Please provide writing assignments by April 10, 2009.

Next meeting: possible double session, 30 attendees, computer projector.

D21: Investigate Supporting IEC Std for Distance Relay Characteristics

Chair: Alex Apostolov

Vice Chair: Alla Deronja

Output: IEEE/IEC Standard

Established: September 2006

Expected Completion Date: December 2008

Scope: Provide an IEEE/PSRC technical input to the ongoing development of IEC Standard 60255-121, dealing with distance relays to standardize impedance relay characteristics, performance, accuracy, and testing aspects.

Working Group D21 met on January 14, 2009, in Atlanta, GA, in a single session chaired by Alex Apostolov with 5 members and 8 guests present. One guest joined the working group as a member.

Murty Yalla provided an update on the current draft of the IEC standard 60255-121, which is being developed by the IEC TC95 Maintenance Team 4, consisting of 27 members from various countries. The main part of the standard includes sections 4 *Specifications of Function*, 5 *Performance Specification*, and 6 *Documentation Requirements*. The standard does not cover additional features available in digital relays such as Power Swing Blocking, Out of Step Tripping, VT Supervision, and Switch On To Fault.

Murty will circulate the standard's draft by the end of January, and the working group members are requested to review the draft and provide technical related comments to Alex. Alex and Murty are members of the TC95 MT4 and will bring the PSRC comments to the WG MT4.

The draft will be circulated in the PDF format and emailed, along with the comments form, to the members and guests of the working group. The comments should be submitted to the working group chair by March so that they can be brought to the WG MT4 meeting in April.

Alex provided an update on the work being done by Subcommittee H working group H5A on common file format for distance relay settings aiming at a consistent and full representation of distance relay settings and terminology. This is a report, which will be an input to IEC TC95 and TC57 WG 10, and the working group will be applying for a PAR to create a respective standard after the report is complete. Everyone interested to review the report can obtain it from the WG H5A PSRC website.

Requirements for the next meeting are as follows: single session, meeting room for 20-25 people with a computer projector.

D22: Performance Testing of Transmission Line Relays for Frequency Response

Chair: Tom Wiedman

Vice Chair: Jun Verzosa

The D22 working group met Wednesday, Jan 14, 2009 at 8:00 am with 8 members and 8 guests present. WG stands at 23 members. This was the WG's fifth meeting.

WG Assignment: Investigate the feasibility of defining a range of frequency and rate of change of frequency to be using in a performance specification for protective relaying functions. If this proves feasible then the WG will pursue the feasibility of developing a test process for transmission line relays subjected to off frequency disturbance including rate of change of frequency conditions during stressed system conditions.

The Working Group discussed Section 9 of Draft 2, proposed draft test for line relays when subjected to off-frequency system conditions, as well as member comments submitted by an email informal ballot. More clarifications on the intent of the tests and more discussions on how the tests should be conducted will be made in the next meeting.

The WG assignment is to provide additional comments/suggestions on Section 9 and be prepared at the May meeting to arrive at a draft test. This draft test will be conveyed to NERC SPCS for their comments.

For the May 2009 meeting, a single session is requested. WG also requests a meeting room for 25 with a computer projector and a power cord.

D24: Transmission Line Applications of Directional Ground Overcurrent Relays

Chair: Don Lukach

Vice Chair: Rick Taylor

Outputs: Report to WG D9, PC37.113, Guide for Protective Relay Applications to Transmission Lines and Report to the PSRC

Established: May 2007

Expected Completion Date: May 2010

Assignment: Prepare a report to the Transmission Line Guide revision working group and PSRC on the justifications and application criteria for directional ground overcurrent relays.

The working group met with 15 members and 12 guests present.

The September 2008 meeting minutes were approved with no changes.

The current assignment of the working group is to develop a report to the PSRC that expands on the topic of directional ground overcurrent relays applied for protection of transmission lines. The assignment is not intended to be a compilation of all the existing documentation of ground overcurrent relaying practices.

The working group discussed Draft D of the outline with a focus on specific topics that would be included and other topics that might be considered. Ground source issues including resonance grounding, and geology, in the context how they impact settings were added to the outline. The discussion on the pros and cons of using ground overcurrent relaying versus ground distance impedance elements for faults with fault resistance was discussed and led to a good discussion on negative sequence of elements. However, the possible inclusion of negative sequence elements for this report is yet to be determined as it has the potential to significantly broaden the scope of this working group. Polarization and pilot elements will not be part of the scope.

Several writing assignments were received prior to this meeting and members agreed to write additional sections by March 15, 2009.

Requirements for the next meeting: Single session, meeting room for 25 people with a computer projector.

Liaison Reports

The items of interest to the Line Protection Subcommittee:

T&D Committee / Distribution Subcommittee.

The next meeting will be at the PES General Meeting in Calgary 26-30 July 2009.

The items of interest to the Line Protection Subcommittee:

The Working Group on Distribution Automation

- Plan to have two panel sessions at the General Meeting in Calgary
 - “DA as Part of the Smart Grid Roadmap”
 - “Information Models for Distribution Automation”
- Continue work on developing Distribution Automation publications
 - A Book on Distribution Automation by the IEEE Press.
 - EPRI/IEEE Guide on DA (wikipedia style) to be launched before the end of January
- Gathering material at the 2009 Distributech conference to update Techwatch, a web report highlighting technology applicable to Distribution Automation.

The Working Group on Switching & Overcurrent Protection

- Continues to work on the “Application Guide for Switching and Overcurrent Protection Equipment”
 - The purpose of this guide is to provide criteria for switching and protective device placement for distribution circuits.
 - The scope will cover feeder and branch line equipment. Drivers for device placement, such as reliability and operational considerations will be identified. All types of switching and OC equipment will be included.

Coordination Reports

None

Old Business

None.

New Business

None.

High Impedance Fault Activity

None reported

H: RELAYING COMMUNICATIONS SUBCOMMITTEE

Chair: V. Skendzic

Vice Chair: Eric Udren

The Subcommittee met on January 14, 2009 with 63 members and guests. Minutes from the September meeting were approved.

Reports from the WG Chairs**H1: Guide for Power System Protective Relay Application of Digital Communication Channels**

Chair: M. Benou

Vice Chair: Ilia Voloh

Output: Guide

Established: May 2006

Expected Completion Date: September 2011

The H1 working group met with 8 members and 5 guests in attendance, chaired by Marc Benou and Ilia Voloh as vice chair.

The September minutes were distributed to members between meetings and asked if there was any objection to the minutes. No objections were received and no one at the meeting objected, so therefore they were approved. The March 2008 IEEE patent policy was distributed.

Draft 2.0, with the latest writing submittals was handed out. Draft 2.0's most significant change was it's change to the IEEE template that was performed by Ilia. Ilia also started editing and making additional changes in an attempt to make it comply with the IEEE style manual.

Other additions included writing submittals for Section 4.1 by Marc, Sections 4.3.1.4 and 4.3.2 by Bob Ince, Section 6.5 by Ken Fodero (which did not make it to Draft 2.0 but was handed out separately), and Section 8.1 by Jim Ebrecht.

The discussion started with the use of the term "teleprotection" since it is not in the IEEE dictionary and was rejected in the title of the guide during the par process. Mal Swanson is going to work on having the term added to the dictionary as well as any other terms that have the same issue.

Marc asked for people to start reviewing the document ahead of the group's discussion at the meetings in order to make the process more efficient. Tom Dahlin and John Miller volunteered to review the guide and Dean Miller volunteered to review Section 7 to find places to make recommendations. More reviewers are needed and the rest of the WG will be asked to volunteer by email.

The WG was reminded to please give all measurements in metric and English measurements can follow in parenthesis. The WG also discussed the need to compare and contrast, talk about the pluses and the minuses in the sections of the guide in order to better help the user to make decisions regarding the use of digital teleprotection - which is the main goal of the guide.

The WG continued to review the guide, starting with section 4.3.1.4. Since there are several versions of a G.703 connector we would like to find out if all pin outs are universal within the same type of connector or if there is a variance and if there is, not to include them in the guide but to mention it in the text. We would also like to add some illustrations of the G.703 connectors.

We still have not come up with a better term than RJ-45 for Section 4.3.1.6 so it will stand until someone can determine a correct term that is recognizable.

Bob Ince was unable to attend the meeting but will be asked to write a few sentences of introduction of Section 4.3.1.7. The table in that section needs to be reviewed for accuracy. A "considered obsolete"

comment is to be removed and the full list of G.703 connectors needs to be added. Marc or Bob will add text before the table in Section 4.3.1.8 explaining that these are maximum values and are typically much less. It was also asked that the table include 1.2, 9.6, 19.2, and 38.4 Kbps data rates.

The WG jumped to Section 8.1 and decided to change the name to Digital Communication schemes and only digital communications or analog communications going into a digital network should be included. Jim will make additions and changes.

We finished by deciding to add self healing to Section 8.3. Mark Simon volunteered to do the work.

H2: Broadband Communications Over Power Line Carrier

Chair: M. Simon

Vice Chair: TBD

Output: Report to the Subcommittee

H2 Met on January 13th with 16 members and guests. Utilities present discussed their BPL activities. Among people in the meeting the activities were experimental without any implementations. IEEE Standard 1675, relating to BPL hardware, was mentioned as being completed and available from IEEE. Interference was discussed in detail. The results of a lawsuit brought from the ARRL to the FCC was discussed. Additionally a report from NATO relating to interference was discussed.

The future state of the group was discussed. Agreement was reached that the group will propose a transition to more diverse communications to the subcommittee.

Proposal to the subcommittee:

BPL represents one of the communication technologies that can be used in conjunction with a utility smart grid implementation. The BPL task force is proposing to widen its scope to include other forms of communication technology. Additionally, the task force would be come a working group meeting at each PSRC meeting rather than the present once per year.

Scope/Assignment:

Produce a working group report to the Relaying Communications Subcommittee that describes example protective relay applications that can make use of the communication infrastructure provided by the "Smart Grid". Protective relay applications will include potential capabilities and the communication requirements necessary to provide suitable communication architectures, services, capabilities, and any other pertinent characteristics.

Title for Schedule Grid etc.:

Relay Applications Using the Smart Grid Communications Infrastructure

H3: Time Tagging in Protection and Disturbance Recording IEDs

Chair: B. Dickerson

Vice Chair: Jim Hackett

Output: IEEE Recommended Practice

Established: Sept. 2006

The WG met on January 13 with 7 members and 12 guests. The IEEE Patent Policy slides were shown and an opportunity was given for attendees to disclose any patent issues. No such issues were identified.

There was much discussion about issues with little resolution, but a wealth of related input was obtained. No assignments were made.

H4: Revision of C37.111 COMTRADE Standard

Chair: R. Das

Vice Chair: A. Makki

Output: Standard

Established 2006

Working Group H4 met on Jan 13, 2009. Sixteen members and eleven guests were present. Minutes of the September 2009 meeting were approved.

We had a discussion on Draft 5 circulated via e-mail prior to the meeting. Draft 6 will be balloted among the WG members as soon as possible.

Jodi Haasz from IEEE Standards association was present in the meeting and she informed that TC95 of IEC is interested in commenting on the document. Draft 6 will also be provided to Dr. Yalla (US representative to IEC) and Jodi Haasz. Chair requested Jodi Haasz to expedite the commenting process from IEC.

We are expecting to ballot the guide among sub-committee members before the May Meeting. We will meet at the May 2009 meeting to resolve comments from TC95 and sub-committee members.

H5-a: Common Data Format for IED Configuration Data

Chair: J. Holbach

Vice Chair: D. P. Bui

Output: Report

Prior to this IEEE-PSRC meeting in January, the WG met in combination with the Western Protection Relay Conference in Spokane one whole day and on Monday the 12th of January 2009 in Atlanta the whole day. The goal was to finalize outlines of the document to describe a distance protection function. We discussed detailed issues submitted from different manufacturers and the first draft was extended as required.

The group met in Atlanta on January 14th with 7 members and 5 guests. The result of the Spokane and Atlanta meeting were presented to the working group. The outline will become posted on our internet site and the manufacturers not able to participate at the Spokane and Atlanta meeting are asked to review the existing outlines and contribute their unique settings into this outline.

Mladen Kenzunovic asked the working group to use any synergy between the working group H5a, H5b and H5c. Fred Steinhauser had some concerns on modeling distance protection characteristics and will supply to the working group examples out of his experience. Christoph Brunner gave a presentation on data modeling in IEC61850 during the meeting.

The working group will try to finish the working group report by end of 2009.

H6 Substation Ethernet

Chair: J. Burger

Vice Chair: C. Sufana

Output: Report

The meeting was called to order by John Burger on January 13 with 11 members and 26 guests present. Minutes from the Vancouver meeting were approved as presented.

Christoph Brunner gave an update on IEC 61850. WG10 met in November and will next meet in February. They are preparing version 2 part 7 CDV and part 6 CDV. Other parts are a little behind schedule. Substation communication between substations is being developed. There has also been discussion on redundancy as the present standard does not support dual I/O ports. He also indicated that work is being done to publish models on the Internet for the different domains. It has also been decided that a report on network topography is to be produced. It is expected that there will be a report developed for conditioned based monitoring.

John Burger asked if there are object models now for wind power. Herb Falk said that there are object models and 4 profiles (one is MMS). There have been some issues that are going to get fixed. All of the parts of wind generator (for example the nacelle, blades, generator, lines) are getting modeled. It is a commercial issue and not technical issue. Mark Adamiak asked if 8.2 is going to have the new GOOSE; a constrained GOOSE to allow use in PLAs. Apparently it is going to be incorporated. Herb Falk indicated that 8-1 has had security added.

John Burger gave a short report on AEP installations. He indicated that AEP is starting to use GOOSE much more for remedial action schemes, SPS, etc.

Herb Falk presented a report on his work with Southern California Edison. SCE has over 100 RAS (Remedial Action Schemes) that they wanted to be centralized. The central processor is capable of handling multiple schemes. SCE asked SISCO to develop methods for testing the schemes. Herb indicated that the present method of doing things was to have an A and B system. He also pointed out the two schemes; although they were identical, did not operate the same way and thus could come up with different actions. By the use of GOOSE the ability to easily cross-pollinate the data between the A and B systems was achieved. Solves one size fits all, overlap, time loss, controller technology limitations. Test proceeded on the SCE system with over 500 miles of T1 in use. SCE uses a full IEC GOOSE. Herb presented a table showing the technology evolution between the existing RAS and the proposed C-RAS. He also explained that direct I/O was converted to GOOSE and a PI Historian used to record the events. The scheme uses 3 processors but the voting is done in the relay. Herb also presented some metrics of the testing. SCE wanted to validate 50 ms response. The nominal was found to be in the 14 to 17 ms; about 10ms of that was due to T1 latency. The scheme is using Dell servers (with an Intel Ethernet card rather than the internal Ethernet connection) and used about 1% of the server capacity. Eighty GOOSE messages were sent and twelve relays were tested. CISCO routers were used to forward the GOOSE messages. Herb also pointed out that SEL brought in 6 relays and they had them installed and commissioned in one day. Herb indicated that SCE figures that they saved \$130M in capital costs and deferred an 800MW generator by using GOOSE and is impressed enough to use GOOSE for smart grid. They were also impressed by the reduction in timing as it went from 122ms to 40 to 14-17.

John Burger indicated that he has copies of both of Herb Falk's papers that are to be presented today and that they will be emailed out.

John Burger asked the working group as what to next do with the paper as it is almost finished. Veselin Skendzic indicated to send the paper to him and he will route it to the H Subcommittee.

H7 IEEE 1588 Profile for Protection Applications

Chair: Galina Antonova

Vice-Chair: Bill Dickerson

Output: Standard

Established: May 2008

The WG H7 met jointly with Substations committee WG C7 for the first time on January 14 with 29 attendees (14 members and 15 guests). After introductions IEEE patent policy slides were presented. Attendees were advised to inform the chairs about any patent issues. None were identified. The motion to approve Sept 2008 meeting minutes was made by Mike Dood, seconded by Veselin Skendzic. The minutes were approved unanimously.

Galina presented an IEEE 1588 status update.

IEEE 1588 is now an approved dual logo standard IEC 61588-2008.

Our PAR was approved in Sept 2008 (C37.238).

Substations Committee WG C7 was formed. WG C7 Chair is Tim Tibbals. We are now a joint PSRC H7/SubC7 working group. Small PAR modifications are needed.

IEC TC57/WG10 needs our profile in early 2010.

We have 2 proposals and a consensus profile proposal.

Galina presented proposed PAR modifications to widen the scope to add Substations Committee participation. A motion by Stan Klein was seconded by Alex Apostolov to approve the modified PAR. Steve Kunsman suggested adding "system wide protection" to the PAR title. Discussion followed. It was decided to leave it as is. The motion was unanimously approved.

We also need to change our Assignment. Galina presented a revised Assignment, which should be approved by Subcommittee H.

Christoph Brunner made a presentation regarding time sync issues and network topologies. Lively discussion ensued.

Veselin Skendzic presented the consensus proposal, which was also discussed by the working group. Between now and the next meeting we will have a consensus draft profile to be distributed to the working group. Galina solicited interested volunteers to submit a paragraph or two on issues of concern.

H9 Understanding Communications Technology for Protection

Chair: M. Sachdev

Vice Chair: M. Benou

Output: Paper

Established: 2006

Expected Completion Date: 2009

Working Group H9 met on January 14, 2009. Ten members and fourteen guests were present. . The former Chair Mohindar Sachdev advised the participants that he would like to transfer his role to a member more qualified to manage the working group. René Midence volunteered and was accepted by the members present. Mohindar Sachdev agreed to remain as new Vice Chair.

Subsequent advice from the PSRC officers resulted with Dr. Sachdev agreeing to remain WG chair, providing experience and guidance to René Midence who will be acting as a group Vice Chair.

Status of the Report: The list of contributions received by the Chair was reviewed. The former Chair stated that he had received only a few contributions until the first week of September. There was a feeling of not enough interest in the assignment of the WG and therefore he had the item 4 "Future Directions of the WG" on the agenda. The participants indicated that there is definitely an interest on the document, therefore the working group will continue with the production of the document. The future of the activity appears promising again. The participants requested if it would be possible to have a copy of the document as of the beginning of September. The new Chair promised to collect all the contributions and to produce the first draft of the document for circulation. In addition, the New Chair will contact those who offered contributions to include their part in the document. The outstanding tasks were reviewed and the new writing assignments marked in the report outline. All writing assignments are due by the end of April 2009.

Outline of the Report: The outline of the report was reviewed and several modifications were agreed on. Some of the important changes are as follows.

From the Meeting of September 2008:

Section 2.0 describing the manner in which communications is used in substations is added. Marc Benou is to provide this contribution. – Status: Not received yet. Chair and Vice Chair agreed to contact Tom Dahlin for providing contribution to Section 7.8. – Status: Not received yet. The scope of Section 8, Electrical Interfaces, is expanded. Oscar will try to provide additional input. If necessary, he will seek assistance from other members of the WG. – Not received yet. Section 10.0 addressing the issue of proprietary protocols is added. Jim Niemera is to provide this contribution. – Not received yet. A discussion on the differences between protocols, interfaces and connectors ensued. Roger Moore agreed to write the Introduction of the report that would include the OSI model explaining the communication's layers. – Not received yet. This task was assigned to René Midence. Roger also agreed to review the outline and provide recommendations so that the WG report follows the OSI model that will make it easier for the readers for follow. – Not received yet. This task was assigned to René Midence. A draft of the outline of the report as it was at the conclusion of the WG meeting is available from the chair. The status of the writing assignments is also indicated on this outline.

Introduced during the meeting of January 2009 – items for which the chair will request contributors: To boil down the protocols covered in IEEE 1615. The document should incorporate basic descriptions with reference to other IEEE. Include in the introductions a couple of paragraphs referring to cyber security, more to bring awareness to the reader. Introduce a short sentence to call the attention of the reader that communications are an important component of the smart grid. Target Date: Drafts are due on or before May 1, 2009. The new vice chair will communicate the new deadline to the contributors.

Future Plan: First draft of the report will be put together and distributed before the next meeting of the Working Group that is planned for May 2009. At the conclusion of this business, the meeting was adjourned.

H10 Naming Installed Intelligent Electronic Devices (IEDs)

Chair: R. Cornelison

Vice Chair: J. Hackett

Output: Paper

Introductions, 8 members, 8 guests. Three of the members participated via telephone and Internet ("remote meeting").

The applicability of aspects of IEC 61850 and IEC 61346 were reviewed. Assignments were made.

A single session with a room for 15 people, a computer projector, and a conference phone are needed for the May meeting.

H11 C37.118 Standard for Synchrophasors for Power Systems

Chair: K. Martin

Vice Chair: B. Kasztenny

Output: Standard

The WG met on Jan 14, 2008 in two sessions with 14 members and 27 guests. The IEEE-SA Standards Board Bylaws on Patents in Standards have been brought to the attention of the WG. The minutes of the September 2008 meeting were approved as distributed.

A response was received from IEC regarding the proposed dual-logo status. According to the new IEEE-IEC agreements, they are proposing that we form a joint working group to allow developing a joint IEC/IEEE synchrophasor standard. The impact on current work and the mechanics of coordination were discussed. Arun Phadke reported that they did a joint WG with IEC for dual logo while doing a revision with the COMTRADE standard and had very good results. By a unanimous vote, the WG decided to respond to the IEC in offering to form a joint WG. The chair will work with IEEE staff to make the response and changes that are required for the PAR and the WG.

The chair reviewed the progress that was made by e-mail since the last meeting. There had been lengthy discussion of changing C37.118 to require a standard algorithm, or requiring response requirements for dynamic conditions. The consensus of opinion was that dynamic requirements are the preferred approach. It was also suggested that we include an optional algorithm that will meet C37.118 requirements.

Presentations on reference algorithms were made by Bill Dickerson and Tevfik Sezi. These provided a background for how a reference algorithm could be constructed and aspects that need to be considered. It was generally agreed two algorithms will be needed, one for each of Level 0 and Level 1 performance.

The chairman summarized the first session for the benefit of new attendees, and reminded about IEEE intellectual property rules.

Fred Steinhauser of Omicron made a brief presentation about testing PMUs under dynamic conditions. Capabilities of the test equipment were demonstrated under step changes and ramp tests, with results shown for three sample PMU devices.

Arun Phadke made a presentation on dynamic testing for compliance with oscillations of magnitude and frequency (combined), and frequency ramp. He presented test results for a simulated sample algorithm. Suggestions have been made as to the limits of the oscillations or ramp tests.

Discussion followed. An issue was raised about ruling out the initial period after starting a test to let the device settle into the oscillation or ramp situations. It was proposed that perhaps the settling time requirement can be used as such a grace period in which TVE is not calculated. Alternatively a full period of modulation can be allowed as a settling time for the modulation tests.

An issue was raised regarding "latency class" requirements – specifying how quickly the measurements must be made available to facilitate control and other closed-loop applications (Jay Murphy and Mark Adamiak).

Ken Martin made a presentation on dynamic testing for compliance. He proposed modulation test, and step change test. Specific proposals have been made as to the limits for the characteristics of the modulations. Ken advocated against having a ramp test. For the step change tests, Ken suggested a mandated settling time, but did not include any other measures of accuracy during the settling interval.

Discussion followed on the importance of step change testing for control applications.

It was agreed that a consolidated approach between Arun's and Ken's proposals would be prepared and circulated for comments and improvements via e-mail.

H12: Configuring Ethernet Communications Equipment for Substation Protection and Control Applications

Chair: E.A. Udren

Vice Chair: J. Gould

Output: Technical Report

The Working Group met on January 14, 2009 with 35 attendees.

The WG reviewed the status of Draft 1, with several new contributions under discussion with authors prior to and outside the meeting. Joe Gould's new contribution on routers focused discussion on the level of detail and the specific content required to fulfill the promise of the title of the WG paper. The volume of material now in this draft is to be reviewed and edited to a Draft 2 for the May meeting.

Herb Falk of SISCO gave a presentation on testing of a network based protection and control system, using the SCE centralized RAS (CRAS) as an example of the implementation and use of condition based monitoring in lieu of manual testing. The WG will add a monitoring and testing section to the document. This needs to address the application-based monitoring or self testing, and its relationship to monitoring via network management software tools and the IT world's network management protocol SNMP.

The WG will meet in Pittsburgh to review the Draft 2 with new submissions.

H13 Understanding Requirements and Applications of the Substation Cyber Security Standards

Chair: S Kunsman

Vice-Chair: E. Udren

Output: Report

Established: January 2008

As a result of the Vancouver meeting, it was decided to meet as a joint WG to see if there is a common interest in preparing the output for Cyber Security for Substations. The joint WG was held on Jan 13, 2009 with 57 in attendance 26 members and 31 guests.

The first order of business was liaison reports on the various cyber security standards:

- NERC CIP - Security Regulations for North American Power Utilities
- IEEE P1686 - Substations IED Cyber Security Standards
- IEEE P1711 - Trial Use Standard for Cyber Security of Serial SCADA Links and IED Remote Access
- IEC 62351 – Data and Communications Security
- CIGRE B5-38 – Impact of Implementing Security Requirements using IEC 61850
- SCC 21 - Smart Grid Initiative
- IEEE 1588 – Standard ... System Time Synchronization (appendix K)

The WG discussed two committees developing one output. Soo Kim from IEEE stated that there is nothing preventing the two committees to work jointly on a single document however there will need to be one committee to have the lead so there is a single interface for the relevant IEEE procedures (PAR submission, balloting, etc).

Rene Midence from RuggedCom made a presentation on security architectures and possible requirements followed by S. Sciacca discussion on key ideas and areas for the work.

The output being a report or standard has been debated over the last 3 meetings and the working group has decided this document should be a standard. The primary reason for the standard is the need for a technical requirements document that has teeth for substation cyber security applications by utilities when specifying products, systems and solutions. A report does not carry this significance.

Title:

Cyber Security Requirements for Substation Automation, Protection and Control Systems

Proposed PAR Scope:

This document provides technical requirements for substation cyber security. It presents sound engineering practices that can be applied to achieve high levels of cyber security of automation, protection and control systems independent of voltage level or criticality of cyber assets. Cyber security includes trust and assurance of data in motion, data at rest and incident response.

Proposed PAR Purpose:

Modern substation automation, protection and control systems, while using technology advancements to achieve greater power system reliability, can be vulnerable to a multitude of security threats. These vulnerabilities and threats can lead to overall power system integrity issues. With the increasing dependency on communication technology and the growing pressure of a secure utility infrastructure, various standardization bodies are in the process of developing cyber security standards where very little effort has gone into the harmonization or rationalization of these standards to the substation applications. Examples of important standards to the utility community are:

- NERC CIP
- IEEE 1686, IEEE P1711
- IEC 62351

This standard builds on the other work to date to produce a specification for a technically feasible cyber security implementation.

Next steps, prepare draft outline, submit PAR and make section assignments.

H15 Coupling Redundancy for Protection systems Using Powerline carrier

Chair: R. Ray

Vice Chair: J. Zipp

Output: Paper

H15 met on Tuesday, January 13, 2009. There were seven members and four guests present.

This was the first meeting of this group. Several people whom the Chair knew to be interested in this document were sent a sample five page document prior to the meeting for their review. Discussion at the meeting centered around the information presented and what items should be added to the document. It was decided that we should add a reference section. Four new sections would be added. These assignments are:

- Short discussion on Modal Analysis – John Zipp
- Pros & cons of various coupling schemes – John Zipp
- If redundancy exists in a coupling system how should the carrier sets be adjusted to alarm a failure of part of the coupling system – Jon Kellner
- Short discussion on the pros & cons of Coaxial vs Triaxial cable – John Miller

These assignments have been made and will be returned to the Chair by April 15th. He will include them in the document and pass the document out for review at the next meeting.

H16 Common Format for IED Event Data

Chair: Marc Adamiak

Vice Chair: Pierre Martin

Output: Standard

Established: September 2008

The WG met on January 14, 2009 for the first time with an approved PAR (PC37.239) to develop a standard for a Common Format for Event Data Exchange or ComFEDE. The PAR is open until Dec 21, 2012. The standard will be based on the report that was issued by the H5b working group in 2008. The primary task

that will be undertaken at this point is validation of the Schema from the report based on input from the various manufacturers. Assignments to map data from a vendor's specific SOE format into ComFEDE format were made as follows:

Scott Anderson – SEL

Mark Adamiak – GE

Juergen Holbach – Siemens

Randy Hamilton – Basler

Mladen Kezunovic - Generic CB model

Steve Kunsman – ABB

Pierre Martin – Areva (Pierre to contact the appropriate person)

If other vendors would like to provide mapping examples, please contact me or Pierre Martin – the Vice Chairman. The examples from the various vendors will be included in the annex of the document.

On the discussion of how the overall document is to be made available, there was discussion as to how the Schema is to be distributed. Specifically, as the Schema, as an XML file, may be updated from time to time, having it available as a series of files – available through the Internet – was deemed as preferable. The chairman took on the task to contact IEEE to get guidance as to how this fits into the IEEE model of distributing a standard.

The final item discussed was the option of providing integrity, authentication, chain of trust, and confidentiality aspects to the document. Stan Klein volunteered to research options and will make a presentation at the next meeting.

HTF1 Application of COMTRADE for Exchange of Synchrophasor Data (New taskforce)

1. Chair: Ken Martin

2. Vice-Chair: Eric Allen

Output: TBD

Established: September 2008

The Task Force met with 14 members and 17 guests present. Ken Martin presented the proposed profile for placing phasor data into COMTRADE format. This profile requires no changes to the COMTRADE standard; it proposes a convention for representing phasor data in the existing COMTRADE standard. If this approach is followed, then the end product of the group would be an application guide for users to place phasor data into COMTRADE. The profile was initially presented at the previous meeting of the task force on September 10, 2008 in Burnaby, BC. The profile was then sent to the HTF1 e-mail list on October 20 with a request for comments by November 7. All comments received were incorporated, and the most recent version of the document was sent to the H Subcommittee on December 12 with a request for comments by January 1, 2009 in anticipation of approval at the January PSRC meeting.

A number of comments about the profile were provided at this meeting. Mark Adamiak mentioned that time quality information is not covered by the schema. He proposed to use digital channels to convey this information and will provide a written description to be added to the profile.

It was noted that the designations "R", "S", and "T" for phase quantities in Europe have largely been replaced by "1", "2", and "3". The use of "1", "2", and "3" as phase identifiers was added to the profile.

Comments were made about providing more guidance in the schema on calculating the value of **timemult**. However, no specific changes to the schema were deemed necessary.

Several comments were made about adding prefixes to channel names in order to specifically identify those channels as being part of a complex pair. Such designations could aid the automatic processing of COMTRADE files by COMTRADE readers. However, the chair, vice-chair, and other members believe that the schema already makes a provision for this identification by the use of "r", "i", "m", and "a" in the second character of the phase identification field (**ph**) and by the ordering of the two portions of each complex quantity as consecutive channels. Furthermore, the current COMTRADE standard (1999) does not define any means of automatic channel identification.

Some of the comments and discussions were about deficiencies in the 1999 version of the COMTRADE standard, not issues with the proposed schema. It was requested that the meeting discussion instead focus on the completion of the template for putting synchrophasor data into the current COMTRADE standard, which is still the 1999 version. Accordingly, a recommendation was made to remove references to the new COMTRADE standard currently under development (such as **tmq_code**) from the schema. The task force agreed with this recommendation.

The task force took a vote on whether to submit the schema, with Mark Adamiak's additions and with references to the new COMTRADE standard deleted, to the H Subcommittee for approval. The vote was 10-1 in favor of this action with the remaining members not voting.

Liaison Reports

PES Substations Committee

J. Tengdin

No report

PES Communications Committee

S. Klein

No report.

TC57, WG10, 17, 18 and 19

Ch. Brunner

IEC TC57 / WG10 is currently working on the following topics:

(1) Preparation of Edition 2 of IEC 61850:

Part 6, 7-1, 7-2, 7-3 and 7-4 have been approved as CDV. The preparation of the FDIS is planned for the first quarter of 2009.

Part 5, 8-1 and 9-2 are planned to be issued as CDV as well in the first quarter of 2009. The other parts will follow in a second step.

Solutions for redundancy based on IEC 62439 will be included in Edition 2.

(2) A new part IEC 61850-7-500 is in preparation that explains the use of logical nodes defined in IEC 61850-7-4 to model applications of a substation automation system.

(3) A technical specification addressing the mapping of IEC 61850 on IEC 60870-5-101 / -104 as used in a gateway has been published as IEC 61850-80-1.

(4) The use of IEC 61850 for communication between substations has been discussed in a task force. A first draft of the planned technical report has been circulated in 2008. Based on the comments received, the task force has prepared the draft technical report IEC 61850-90-1 that will be published this spring.

(5) A new task force has been created that will prepare a technical report with network engineering guidelines.

(6) IEC 61850-9-1 will be withdrawn in 2010. In the future, only IEC 61850-9-2 shall be supported.

(7) For the future, it is planned to publish the object models from all domains that create standards based on IEC 61850 as a web based standard. Work has been initiated to define the requirements and procedures associated to that.

(8) A new task force will be created that prepares a report discussing the aspects of condition monitoring and IEC 61850.

IEC TC57 / WG17 has issued the FDIS of IEC 61850-7-420: object models for distributed energy resources.

IEC TC57 / WG18 is preparing IEC 61850-7-510: use of the logical nodes defined in IEC 61850-7-410 to model applications for the control of hydro power plants

IEC TC57 /WG19 is responsible for the overall harmonization within TC57. One core focus is the harmonization between the world of field devices (IEC 61850) and the control centre and system level applications (CIM standards; IEC 61968 / 61970).

IEC TC57 /WG15 is responsible for security. Work items include IEC 62351-7, objects for network management and system security and IEC 62351-8, role based access control for power system management.

Old Business:

Correction and approval of H SC minutes (September 2008): Minutes were approved

New Business:

H2 Chair Mark Simon requested a change of assignment for his WG, now titled *Relay Applications Using the Smart Grid Communications Infrastructure*. The SC approved the change.

Jodi Haasz of IEEE Standards described the agreement that has finally been achieved with IEC Technical Committee 57 on dual-logo or cooperative publication of C37.94 optical multiplexed digital signaling and C37.118 Synchrophasor Standard. IEC wants a change to review, contribute and vote. For C37.94 (not currently in revision), Tom Dahlin of SEL and Herb Falk of SISCO took assignments to document protocol application that does not conflict with IEC standards. For C37.118 (currently in revision), H11 Chair Ken Martin will help with coordination.

I: RELAYING PRACTICES SUBCOMMITTEE

Chair: T. Sidhu

Vice Chair: R. Beresh

The Subcommittee met on September 10, 2008 with 31 members and 52 guests – a quorum was achieved.

- Approval of previous I minutes from Vancouver, 2008 – approved
- Adcom mentioned that there was a record attendance of more than 250 from the PSRC
- Adcom is requesting presentations for the main committee meetings
- The Arlington Sept 2009 meeting will be extended by ½ day (Wed PM) with SC meeting on the Thursday am and main committee meeting Tuesday pm

Reports from the WG Chairs

I1: Understanding Microprocessor Based Technology Applied to Relaying

Chair: Mohindar Sachdev

Vice Chair: Ratan Das

Output: Report to the Main Committee

Expected Completion Date: 2008

The Working Group did not meet in January 2009 during the joint technical meetings of the PES Committees in Atlanta.

After the September meeting of the PSRC, the Chair received comments from the PSRC Chair suggesting some changes in the WG document. The suggested changes did not change the intent of the document. It took two iterations to make the changes that satisfied the PSRC Chair. The modified draft was then circulated to the WG and Subcommittee members for comments of substance. The WG document is ready and a copy has been given the I Subcommittee Chair for posting on the Subcommittee website. Another copy has been sent to Russ Peterson for posting on the PSRC web site.

The WG has completed its task and it is recommended that the WG be disbanded.

The SC disbanded the WG with thanks to the Chair and all members for their contributions.

I2: Terminology Review

Chair: Mal Swanson

Vice Chair: Barb Anderson

Output: Definitions for C37.100 and IEEE Std. 100

Meeting: Sept 8, 2008

The I2 working group met at 11:00 am on Tuesday, January 13, 2009 with eight members and four guests. John Tengdin and Andre Uribe joined the working group. Mal Swanson chaired the meeting.

Minutes from the last meeting were approved.

C37.234: Oscar discussed the revisions to this document, which included removing definitions that were not related to protection. The working group recommended that Oscar request that all the original terms be kept in the Definitions section of the standard.

C4 Working Group paper: The working group discussed the term, "contingency", which will be added to Group #6.

Mal updated the working group on the IEEE Definitions Database:

1. All working group chairmen can gain free access to the Database by emailing a request for a password to Matt Ceglia at m.j.ceglia@ieee.org.
2. All working group chairmen need to be sure to have definitions in a separate "Definitions" section, if they are developing a Standard, Guide or Recommended practice.
3. Working group Chairmen can feel free to define non-protective terms in this section.
4. Matt Ceglia will give members of the I2 Terminology working group passwords to the database by next week.
5. Definitions must have a source document (Standard, Guide or Recommended Practice) to be included in the database. The working group will research with previous members to find sources for some terms in Groups 1 through 3.

Barb Anderson will have the newest revision of Group #6 emailed to working group members and Russ Patterson as "DND 6_Rev.059". She will also email revised Groups 1 through 5, as well.

Barb will also check protection terms submitted by I2 to C37.100 to see if they have been included in the Database.

I3: Relay Functional Type Testing

Chair: Jerry Jodice

Vice Chair: Bryan Gwyn

Output: Report

Meeting: #3 – September 9, 2008

The WG met with 9 members, 9 guests

The working Group focused on the structure of the report and decided on the sections that are needed and assigned authors to those sections

A standard template was agreed for writing a test report on a specific functional test

Several members will write a test report based on the specific example that they had previously presented to the Working Group.

A number of reports have been identified in the Industry on this topic and will be evaluated for referencing

The Working Group will continue to liaise with C11 - Guide for Power System Protection Testing to ensure there is no duplication of effort

I4: IEC Standards Advisory

Chair: Eric Udren

Vice Chair: Mario Ranieri

Output: Comments and votes to USNC of IEC on TC 95 (Measuring Relays) Standards projects and drafts. Reports to PSRC on IEC standards development.

The WG met on January 13, 2009 with 7 members and 1 guest.

Typically, the WG discusses TC 95 documents, some requiring a vote to be sent through USNC. In this meeting cycle, however, the WG got a break – IEC circulated no new standards documents.

Murty Yalla is Convenor of Maintenance Team (MT) 4 of TC 95, developing new IEC relay functional standards. His team met in conjunction with the IEC General Meeting and TC 95 meeting in Sao Paulo, Brazil in November. He reported on progress of functional standards projects in MT4:

- 60255-151 –Functional standard for over/under current protection – excellent draft is nearly ready for final draft international standard (FDIS).
- 60255-127 - Functional standard for over/under voltage protection - a single curve implementation similar to -151, making progress and needing more work.
- 60255-121 – Functional standard for distance protection – in early phase of development, and needs a lot of work to achieve formal CD.
- 60255-149 – Functional standard for thermal relays – not yet begun – update 60255-8.
- 60255-187-1,2, etc. family of standards - Functional standard for differential protection – bus, transformer, line, etc. – not yet begun, and needs more definition.

Jodi Haasz of IEEE Standards described an accord she developed with IEC after a long deliberation process, on how to achieve dual logo status for C37.94 on optical fiber communications to multiplexers, and C37.118 Synchrophasor standard. There will be joint development projects in which IEC groups can comment on drafts. With this, IEC is enthusiastic about participation.

I5 Schematic Representation of Power System Relaying

Chair: Kevin Donahoe

Vice Chair: Dave Zinn

Output: Report

Meeting: #4 – September 10, 2008

Jeff Long filled in for Dave Zinn.

The Working Group met for a single session with 6 members and 6 guests totaling 12 attendees on Wednesday, Jan. 14, 2009.

K. Donahoe started off by noting a drop in attendance due to simultaneous scheduling of WG C16 – Relay Scheme Design using Microprocessor Relays. Both working groups share the same membership, so our

WG meeting attendance was split. This was followed with a review of the minutes from May, introductions and discussion of proprietary and patent information.

Jim Platt of Bonneville Power gave a presentation titled: One Lines & Schematics, "The BPA Way". Information provided on standard representation of multi-function relays (set 1/set 2) in a 500kV breaker-and-a-half scheme. A full set of one-lines, three-lines, dc control, and wiring drawings were presented. J. Long provided a sample schematic of how to represent an ANSI 11 multi-function relay in a one-line diagram.

Discussion ensued on ideas for future assignments

J. Long suggested this group should offer methods for depicting IEC61850 GOOSE messages on schematics. K. Donahoe offered to make a presentation on the use of GOOSE messages to replace breaker failure relays. He noted that the GOOSE messages were shown in a table format. In May, WG will need a meeting room accommodating 30 along with a projector.

I6: Practical Aspects of Rogowski Coil Applications to Relaying

Chair: Ljubomir Kojovic

Vice Chair: Bob Beresh

Output: Guide

Meeting: #1

Group met on Wednesday January 14, 2009 with 14 attendees.

This was our second meeting after completion of IEEE Std C37.235™-2007: IEEE Guide for the Application of Rogowski Coils Used for Protective Relaying Purposes.

WG assignment is to produce a special report describing practical aspects of Rogowski Coil applications to relaying. Main discussion was about the table of contents.

I9: Revision of C37.105 Standard for Qualifying Class 1E Protective Relays and Auxiliaries for Nuclear Power Generating Stations

Chair: Sahib Usman

Vice Chair: Roy Ball

Output: Revision of Standard C37.105

1. The WG discussed the latest draft D10-8 that has incorporated resolutions and responses to all the negative comments on the previously balloted draft.
2. Additional relevant changes were discussed in details. These changes are being incorporated in the final draft D10-9 to be issued soon for re-balloting. Jeff and Mario have volunteered to prepare the final draft.
3. Matt Ceglia of IEEE SA advised that, for re-balloting, we need to submit to IEEE SA the following documents :
 - The latest draft of the standard
 - A spread sheet containing all negative comments/ballots, resolutions of all negative comments, and explanations for all additional changes included in the latest draft.
 - A cover letter
4. A bridge document will also be prepared to link the C37.105 -1987 standard, the 2004 draft issued for balloting, and the latest draft to be issued for re-balloting.

5. The WG is planning to get ready all necessary documents for re-ballotting in about 2 months (by the end of April, 2009).

I10: Revision of C37.98 Standard for Seismic Testing of Relays

Chair: Marie Nemier

Vice Chair: Munnu Bajpai

Output: Revision of Standard C37.98

Meeting Minutes January 13, 2009

There were following members were in attendance:

- Marie Nemier – Co-chair PSRC
- Suresh Channarasappa – Co-Chair SC-2
- Munnu Bajpai - PSRC
- Roy Ball – PSRC

Following is a review of the items discussed and the resulting action items.

1. The IEEE SA Standards Bylaws on Patents in Standards and Inappropriate Topics were reviewed.
2. Copies of the PAR were distributed and reviewed. Review of the PAR found that the PAR had been modified and the joint sponsorship was no longer on the PAR. Action item: Marie Nemier shall follow up with IEEE to determine how to restore the joint sponsorship to the PAR. Note: After the meeting, Marie Nemier met with Soo Kim from IEEE. Soo indicated that in fact the joint sponsorship was inadvertently dropped when the PAR was modified. She will follow up with Matt Ceglia and Lisa Yacone from IEEE to determine the action necessary to restore the joint sponsorship.
3. Joint sponsorship of C37.98 between the PSRC and NPEC was reviewed. It was agreed that members of both working group will be copied on all information and meeting announcements. Following is the current list of the membership for both working groups: PSRC I-10 NPEC SC-2.6

Marie Nemier – Co-Chair Suresh Channarasappa
Roy Ball Melanie Brown
Munnu Bajpai Arnold Offner
Mario Ranieri Dan Mikow
Jeff Burnworth

4. Draft 2.0 November 2008 was distributed and it was agreed that the following topics will be addressed in the revision of the standard:
 - Update relay types in Table 1 to include multi-function, solid state & software based relays and to coordinate with C37.105
 - Use of the term ZPA
 - Coordination with IEEE 344 current revision
 - High frequency content
 - Contact monitoring criteria
5. A conference call is scheduled for Wednesday February 4, 2009 at 9:30am. A meeting announcement will be sent out to all members.
6. 6. The next meeting of the SC-2 is in Knoxville, TN April 6-8. A working group meeting will be held at this meeting

I11: Guide for Applications of Optical Current & Voltage Systems

Chair: Harland Gilleland

Vice Chair: Bruce Pickett
Output: Guide
Meeting: January 13, 2009

The meeting was called to order with 9 members & 2 guests. We opened with a Welcome and Introduction of Attendees. There were opening discussions and review of the Agenda by Harley. Also a review Of topics being covered in the 11 Sections in the Guide

Next there was a focus on the five Sections and areas where work is primarily needed – where we had spirited and productive discussions on the following topics:

Presentation by Farnoosh Rahmatian on Performance
Presentation by Michael Mendik on Testing
Discussion led by Vahid Madani on Applications
Presentation by Don Parker on Training

Harley discussed the changes in Working Group I-8 – including that it would become WG I-11 – and that a PAR is being developed and submitted. All of the previous work from I08 would be folded into the new WG. New WG to be entitled “WG-I-11, Guide for Application of Optical Instrument Transformers for Protective Relaying”.

We request that the WG I-11 session stay on Tuesday but moved from the 4:30 time slot – which is a conflict for a number of our key member – so they can not attend the I-11 session.

I14: Revision of C37.2-1996 Device Function Numbers

Chair: John Tengdin
Vice Chair: D. Holstein
Output: Revision of Standard C37.2-1996 joint with Substation WG C5
Meeting: May 14, 2008

No Report

I15: Revision of C37.110 – Guide for the Application of Current Transformers Used for Protective Relaying Purposes

Chair: George Moskos
Vice Chair: Barry Jackson
Output: Revision of Standard C37.110-1996
Meeting: September, 2008

Working group did not meet.

I17: Trends in Protective Relaying Performance

Chair: Mark Carpenter
Vice Chair:
Output: Periodic Reports to Subcommittee

The working group I17on Trends in Relay Performance met with 2 members and 13 guests on Tuesday January 13, 2009. The results of the 2007 report were reviewed and discussed. The report is available and will be posted in the PSRC web site as soon as possible. The 2008 data is being collected and will be

published before the May meeting. There was a good open discussion on trends as we move away from electromechanical relays and for the next meeting Mr. Phil Winton of Georgia Power and Mr. Gregory Sessler of ATC have agreed to make presentation on trending activities in their perspective companies. In an effort to keep this committee going Mr. Mark Carpenter has asked that I assume the responsibility of chairman for this working group with Mr Gregory Sessler as vice chair, with the committee's approval.

I18 Anomaly Checks for Relay Settings

Chair: Peter McLaren

Vice Chair: Mukesh Nagpal

Output: Report to main committee

Meeting: # 4 – September 09, 2008

The WG met for a single session with 11 members and 6 guests

The WG further discussed the draft questionnaires for manufacturers and utilities. The questions on security aspects were moved to the end of each questionnaire and some minor modifications were made to other questions. The WG decided that with these revisions the questionnaires were ready for circulation. The circulation would be in the form of an email directed to individuals within the PSRC. The Chair undertook to organize the circulation as soon as the alterations to the questionnaires were complete.

The WG will meet for a single session at the next meeting, 20 people and we need a CP.

“The WG will produce a report on relay software features and setting practices which minimize the possibility of wrong settings being downloaded to a relay. The WG will commence its task by conducting a survey of relay manufacturers and utilities to get information on present practice.”

I19: Protective Relaying and Redundancy

Chair: S. Ward

Vice Chair: B. Gwyn

Output: Report to the main committee

Estimated Completion Date: Sept 2009

Meeting #2 – May 13, 2008

The WG met with 26 members and 25 guests. Update on NERC SPCTF activities. The Working Group liaises with the NERC SPCTF on Protection Redundancy issues. The White paper on Protection Reliability has been completed and is now on the NERC web site. There will be a Tutorial on the White Paper this evening at 6 PM in Capitol South

The Report is practically completed with all major assignments complete and only a few minor contributions remaining including LAN Ethernet separation. Three people volunteered to review the whole document for consistency The Chair predicted that the report could be complete by the September meeting

The WG will liaise with the new H15 - Coupling Redundancy for Protection Systems using PLC

Next meeting 30 people, with computer projector

I20: Revision of C37.90.1 SWC Tests

Chair: Tom Beckwith

Vice Chair: Tom Tennille

Output: Periodic Reports to Subcommittee

Output: Revision of C37.90.1 SWC Tests Standard

Meeting: September 9, 2008, Vancouver, BC

The fifth meeting of the Working Group (WG) I20 met on January 14, 2009, in Atlanta, GA, in a single session with 13 Members, and 6 Guests.

The Minutes of Meeting #4 in Vancouver, BC, on September 9, 2008 were approved as submitted.

Review of IEEE PC37.90.1 Draft 3 Status

Tom Beckwith presented the present status of Draft 3 of the revised standard. The WG discussed the new revision provided by Mario Ranieri and Jeff Burnworth that edited the Draft 3 document to put it into the latest IEEE standards template format. A MS Word comparison will be performed to assure no changes in content occurred during implementation into the standard format.

The WG then discussed the latest revisions of waveforms and test applications of the associated IEC standards, and how PC37.90.1 should address or harmonize with the revised IEC standards. Differences in the damped oscillatory were illustrated and discussed. The WG also discussed the new IEC test requirement to apply a reduced magnitude (2kv) transient waveform in a transverse mode to communication inputs. The WG questioned if IEC could provide background information or reason for the most recent revisions in waveforms and application.

A vote was taken on whether to adopt the revised IEC damped oscillatory waveform. The result of the voting was 11 yeas and 1 nay.

Working Group Assignments

Jeff Burnworth: Provide a comparison documents illustrating changes in Draft 3 before/after conversion to the standard IEEE template format.

Mario Ranieri: Identify clauses in Draft 3 that are associated with harmonizing with IEC standards.

Tom Beckwith: Acquire additional IEC standards required for reference.

Bui Dac-Phuoc & Jay Murphy: Review comparison table listings developed by Mario Ranieri and Jeff Burnworth for accuracy.

Ryan Bares: Review waveforms for inputs associated with harmonization.

Murty Yalla: Will contact the IEC to provide background information or reason for the most recent revisions in waveforms and application.

Next Meeting Requirements: Single session; 20 attendees; Computer Projector.

ITF1 Manufacturer's Service Letter Database

Chair: Jerry Jodice

Vice Chair:

Output: Service Letter Database

Meeting: September 10, 2008

I TF#1 met today. There were four PSRC members present. Mark Simon, Simon Richards, David Ward, Mario Ranieri. There have been no submissions of advisories since the last two meetings.

Offers of advisories from Bob Dempsey and Jeff Pond are expected...and will be transferred to the open DB at Doble. Chair will follow-up via email.

Simon Richards will request authorization to allow ITF 1 to provide a link to his companies web advisory & application services, as a means to access these reports.

Many past & present participants are concerned about supplying these public advisories, because of the potential negative impact on their associations with manufacturers.

For this TF to be successful, in providing archival knowledge to PSRC members, it was suggested that a PSRC [officer] request advisories from those relay manufacturers whose products are sold in North America.

I suggest a formal request be issued by the Chair of the main Committee, for maximum impact.

I am happy to provide whatever follow-up to that request is appropriate.

ITF2: Promotion of Dual Logo of C37.2

Chair: John Tengdin

Vice Chair: TBD

Output: TBD

Meeting: January 13, 2009, Atlanta GA

The meeting was attended by five members and guests: Zeeky. Bukhala@ge.com, [Jeff Gilbert \(jggilbert@ppweb.com\)](mailto:JeffGilbert@ppweb.com), Jodi Haasz (j.haasz@ieee.org), j.t.tengdin@ieee.org, Murty Yalla (myalla@beckwithelectric.com)

The TF Chairman advised that the Chair of the PES Substations Committee has decided to pursue the possibilities of an IEEE/IEC dual logo project with IEC TC 57, and that a letter to the Chairman of IEC TC 57 has been sent – but no response to date.

Given the uncertainty of the IEC response, no meeting of I TF2 should be scheduled for the PSRC May meeting.

ITF8 Revision to C57.13.3 - Guide for Grounding of Instrument Transformer Secondary Circuits and Cases

Chair: B. Mugalian

Vice Chair: Bruce Magruder

Output: Revision of IEEE/ANSI C57.13.3-2005

Expected Completion Date:

The Task Force ITF8, Revision of C57.13.3 - Guide for Grounding of Instrument Transformer Secondary Circuits and Cases, met in Georgia 6, Sheraton Atlanta Hotel, Atlanta GA on January 14, 2009. Four members and three guests were present.

The Task Force discussed the plan to review the relevant IEC standards related to the grounding of instrument transformer secondary circuits and cases. A list of potential IEC documents was reviewed and approved. The Chair will work with the IEEE office to obtain copies of these documents. The Task Force Vice-Chair will create a spreadsheet for the group to use to match up appropriate IEC and other documents to existing sections in the Guide. Other IEEE documents were suggested for review and will be obtained. One member (J. Pond) will be reviewing the NEC book. One member (Z. Bukhala) will be reviewing grounding practices used in China. The Task Force will need one more session to develop an outline of work, and will submit a proposal to the I Sub-Committee for review. If the proposal is accepted, a working group will be formed.

The Task Force will meet in Pittsburgh in May 2009 to discuss the spreadsheet of potential revisions to the Guide. We will use the Wednesday 8:00 a.m. time slot, room for 25 people, and will need a computer projector.

Liaison Reports

RE: Instrument Transformer Sub Committee, Liaison

The Instrument Transformer Sub Committee met in Portugal this fall. The minutes have been approved but are not yet posted. The Transformer Committee is not with us at this joint meeting.

1. The latest version of the C57.13 .2008, Instrument Transformer Standard, has completed Standard Committee balloting and is now out for printing.

A new task force has been created to review further proposed changes to C57.13. The chairman, Jim Smith, is seeking any changes that the PSRC members would like to see reviewed.

2. The optical standard was out for vote so the Working Group did not meet this fall.

Coordination Reports

None

Old Business

None

New Business

- I 19 suggested to create a group to start a survey for redundancy i.e. make a new updated survey for redundancy.

J: ROTATING MACHINERY PROTECTION SUBCOMMITTEE

Chair: K.A. Stephan

Vice Chair: M. Yalla

The Subcommittee met on Jan 14, 2009 with 23 members (achieving quorum) and 9 guests. There was a call for the approval of the minutes of the May 2008 meeting in Kansas City and Sept 2008 meeting in Burnaby, BC, Canada. The minutes were unanimously approved by the subcommittee members.

Reports from the WG Chairs

J1: Protection Issues Related to Motors Connected to Adjustable Speed (Frequency) Drives

Chair: J. Gardell

Vice Chair: P. Kumar

Established: 2003

Output: Report to the Subcommittee

Expected Completion: Dec 2008

Status: Draft 8 (Final)

The Working group did not meet at this meeting and there is no report.

J2: Protection Considerations for Combustion Gas Turbine Static Starting

Chair: Mike Reichard

Vice Chair: Zeeky Bukhala

Established: 2005

Output: Report to the Subcommittee

Expected Completion: 2009

Status: Draft 2A

Eleventh meeting – Single session January 13, 2009

Introductions – 9 members & 10 guests

The WG reviewed and approved the September 2008 meeting minutes without revision.

The WG reviewed and Draft 2b of the paper and made the following assignments:

- Key Protection Elements and Considerations
 - B Drive Mechanism Protection
 - Page 6. Revise text to make the presentation more balanced, some suggestions include delete text characterizing one manufacturers protection as “minimal”. (Reichard)
 - Figure 7: (Reichard)
 - Add transformer vector groups
 - 87T should have three separate CT inputs
 - Show each transformer leg connected to independent inverter
 - Correct trip action to show “Trip 52SS” instead of “Trip 52”
 - C Generator Protection (Reichard)
 - Add text addressing differential protection strategies for startup and normal operation.
 - Figure 8
 - Add Aux Bus with CT for 87GT
 - Add 59BN
 - Show 51TN, 87T and 87GT as “Used in Start Up & Normal Operation”
 - Delete “Bulk”
 - Show GSU vectors
 - Figure 9
 - Add Aux Bus with CT for 87GT
 - Add 59BN
 - Delete “Bulk”
 - Show GSU vectors
 - Show 89-DS as closed during start up and normal operation
 -

(NEW) Conclusion. Write a conclusion for the paper including references to IEEE Transformer and Generator Protection guides. (Gardell).

J7: Revision of C37.101, Generator Ground Protection Guide

Chair: J.T. Uchiyama

Vice Chair: R. Das

Co-Vice Chair: Mike Reichard

Established: 2000

Output: Revised Guide

Status: Completed

The Working Group did not meet this session.

J8: Generator Tutorial Revision

Chair: Michael Thompson

Vice Chair: Chris Ruckman

Established: 2007

Output: Tutorial (published by PSRC)

Expected Completion Date: TBD

Status: Draft 0.2

Assignment: Review and Revise 95-TP-102, “IEEE Tutorial on the Protection of Synchronous Generators.”

The Working Group met for a single session with 20 members and 12 guests.

Output will be a special publication of the PSRC and published on the PSRC website. Phase two output will be an eight-hour tutorial presentation. An expected date of completion for phase 1 is 2009. We are presently on draft 0.40.

The minutes of the September, 2008 meeting were approved during the J8 working group meeting.

This chair commented that the TDS (technical document specialist) resource made available during the November – December timeframe went mostly unused. The resource will again be available between March 1 and the May meeting. The chair emphasized that the drafts need to be sent to the TDS resource for final editing. The next available time for the resource after May, 2009 is November, 2009.

The chair noted that it would be preferred to use the J8 website for peer reviewed drafts only. Drafts during the peer review process are best handled via email between the author and reviewer. A status document is on the website to reference who the author and peer reviewers are for the various sections and the status of the documents.

Reports were given by the authors and/or peer reviewers on the individual sections. See detailed minutes on J8 web site for details.

J9: Motor Bus Transfer

Chair: Jon Gardell

Vice Chair: Dale Fredrickson

Established: 2006

Output: Transactions paper or report

Expected Completion: TBD

Status: Draft 0

The Working Group met in a double session with 18 Members and 14 Guests on Wednesday, January 14, 2009. This was the ninth meeting.

Jon Gardell gave a status report of the work performed to date.

The first session was used to discuss the planned field testing and data acquisition at the TVA Paradise Plant. Hugo Monterrubio presented results of a meeting at the plant to develop an initial plan for testing and monitoring motor bus transfers. Monitoring locations and equipment have been identified. The Working Group suggested several additions to the points to be monitored. Discussed the data to be captured during the test period, including transfers which may occur naturally and possibly some staged tests if the plant allows. Plans are to install the equipment in the first half of 2009.

The second session's focus was to review outstanding assignments from the previous meeting. Previous assignments were clarified and discussed. Five additional topics discussed at the Vancouver meeting were reviewed and the Working Group agreed they should be included in the report. Discussed the need for addressing issues of adjustable speed drives and arc flash in particular. Unassigned report sections will be deferred until after the field testing is completed.

A number of assignments were made that are due by April 15, 2009 to the Chairman.

J10: Guide for AC Motor Protection

Chair: Prem Kumar

Vice Chair: Dale Finney

Established: 2007

Output: Guide Revision

Expected Completion:

Status: Draft 0.2

The meeting was attended with 11 members and 6 guests. After the introductions, the Patent Slides were shown.

The Vancouver meeting minutes that were circulated were approved with quorum.

Draft 1 of the document was created by locating the various assignments received in different sections of the document by Prem and Dale. This was electronically circulated to the members prior to the meeting. The

rational for the various locations was discussed in the meeting. The working group members were requested to review by April 15th the choice for the locations.

Various assignments were reviewed. Following are the follow-up action items/assignments based on meeting. All remaining assignments/peer reviews are due by April 15th. WG members will copy relevant section from D1 draft and make modifications as required and send to Prem for incorporation into next draft of document. The various item number topics (see J10 working group minutes) and assignments are summarized below.

- Wayne Hartman would add column in fault table so as to cross-reference various types of faults with applicable protective functions that would detect them (Item 1). He would also do the figures in Visio for motor speed torque curves(item 3).
- Prem Kumar/Kevin Stephan would check with IEEE for copyright issues on using table from buff book. Prem would also check with IAS for a possible liaison with buff book.
- Pat Kerrigan would peer review Dale Finney's summary of J1 ASD protection report (item 8).
- Suhag Patel would review tables inserted for items 14 and 15 (MG1 reference documents on insulation class) to be from latest buff book and modify as required. Chris Ruckman pointed out those tables did not match the latest IEEE buff book.
- Summary of Item 9 (J9 Motor bus transfer) that would need to be included in guide would be assigned later.
- Items 5 and 7 and 10 would be peer reviewed by Chris Ruckman (carry over from last meeting assignment).
- Tom Farr would submit item 6. (carry over from last meeting assignment).
- Prem would provide a large induction motor data. Joe Uchiyama would provide a large synchronous motor data. The WG would use that for the motor setting example (item 4).

JTF3: NERC Generator Protection Response (Generator Backup Relay Application and Verification)
Chair: Joe Uchiyama

Vice Chair:
Established: 2007
Output: Special Report
Expected Completion: TBD
Status: Outline

JTF3 did not meet this session.

The related sub-team of the NERC SPCTF has been working on a document on "Power plant and transmission system protection coordination".

This document will help NERC document PRC-001 and the following topics from the SPCTF team are of interest to the JTF3 PSRC task force:

1. A voltage of 0.85 pu on the high side of the generator step up transformer (GSU) is used to indicate a transmission system under extreme emergency conditions.
2. Phase distance function (21) on the generator versus phase distance on the transmission system.
3. 51V on the generator versus 50/51 on the transmission system.
4. 51T and 51TG on the GSU versus 50/51G on the transmission system.

The previous SPCTF draft has been updated with major changes and expected to have a final draft available by June 2009. The NERC SPCTF (NERC task force) has now been "upgraded" to a NERC sub-committee.

**Liaison Reports
Electric Machinery Committee**

C.J. Mozina

The Committee met at PES General Meeting in Pittsburgh, July 21-25, 2008. Of interest to the PSRC is a recent establishment of a new WG on generator-grid interaction. This WG is to investigate generator shaft torque stresses due to transmission system events such as: faults, high speed reclosing, series capacitor switching (bypass and automatic reinsertion) and single pole tripping. No minutes of the Pittsburgh meeting have been reported on the Electric Machinery website. The PSRC should consider establishing liaison with this WG. The chairman is Tom Wait (trw104@sbcglobal.net).

AS I&CPS Committee

C.J. Mozina

This report will be given at the main PSRC committee meeting. The written report is published under main committee liaison reports.

Nuclear 1E WG

P. Kumar

No report

NERC

J. Uchiyama

The SPCTF which was a task force has been upgraded to subcommittee status as SPCS (system protection and control subcommittee)

Coordination Reports

None

Old Business

Subcommittee members thanked Wayne Hartmann for his service as a Vice-Chair/Chair of the Rotating Machinery subcommittee for the past 6 years.

New Business

The subcommittee chair displayed the pre-PAR patent slide to all the subcommittee members and guests.

Regarding the reaffirmation of the C37.106-2003 "Guide for Abnormal Frequency Protection for Power Generating Plants":

The subcommittee chair (as ballot designee) submitted the reaffirmation ballot and the results are as follows:

Total number of ballots: 84

Approval 96%

Total number of comments was 12 and there were 2 negative ballots (4 of the 12 comments)

The negative ballots were reviewed by the subcommittee and it was decided that these comments do not require a revision of the guide at the present time.

The subcommittee chair will write to the negative balloters indicating the comments will be considered at the next revision of the guide.

The subcommittee chair described policy on electronic dissemination of copyrighted IEEE documents. This policy pertains to the posting of PSRC-authored work on the PSRC website and other places including authors' employer's websites. The policy can be accessed on the following web link of the IEEE Intellectual Property Rights (IPR) Office:

<http://www.ieee.org/web/publications/rights/policies.html>

[Post-meeting Notice: Written permission was received from the IEEE IPR Office to continue posting the Transactions Paper of J6, Performance of Generator Protection During Major System Disturbances and adding the work of J5, Coordination of Generator Protection with Generator Excitation Control and Generator Capability to the PSRC website]

K: SUBSTATION PROTECTION SUBCOMMITTEE

Chair: F. P. Plumptre

Vice Chair: P.G. Mysore

The K-Subcommittee met on Wednesday January 14, 2009 in Atlanta, GA, with 26 out of 39 members and 22 guests in attendance. Quorum was reached and the minutes of the September 2008 K subcommittee meeting in Burnaby, BC, Canada was approved.

ITEMS OF INTEREST FROM THE ADVISORY COMMITTEE MEETING:

Over 250 people registered at the January 2009 meeting setting a record.

The chair requested information from the working groups who are completing or have just completed their work for presentation at future PSRC meetings. Any information regarding presentation should be sent to Roger Hedding with copies to Frank Plumptre and Pratap Mysore.

The September 2009 meeting in Arlington, TX will have a new format. The subcommittee meeting will be on Thursday September 17th morning and the main committee meeting will be in the afternoon. Please make appropriate travel plans.

Reports from the WG Chairs

K1: Protection of Transformers against faults and abnormal conditions

Chair: Mohindar Sachdev

Vice-Chair: Pratap Mysore

Established: 2003

Output: Revision of IEEE C37.91-2000

Expected Completion Date: 2007

Guide: Balloted and Approved , Summary Paper expected to be completed by 2009

The Working Group K01, Protection of Transformers Against Faults and Abnormal Conditions, met during the PSRC meetings in Atlanta. Three members and four guests were present.

The Chair reported that C37.91 guide was published in May 2008. He further reported that he started writing the summary paper but needs direction from the WG. Two approaches were considered. The first is to provide a summary of the contents of the guide. The second approach is to provide a very brief description of the topics discussed in the guide but provide details of major additions made to the guide during this revision. The WG approved this later approach. The Chair will prepare the paper and will circulate it among the WG members for approval. The draft will also be circulated among the Subcommittee members concurrently for approval.

KTF2: Revision of C37.108-2002 Guide for the protection of Network Transformers

Chair: Charlie Sufana

The task force KTF2 Revision of C37.108 Network Transformer Protection Guide met on September 9, 2008 with 5 members and 3 guests attending. This was the second meeting of the task force.

Chairman Charles Sufana went over the results of the re-affirmation ballot. The guide was reaffirmed in December 2007. However, there were several negative ballots that needed to be reviewed.

The task force chair went through each of the negative vote comments. After some additional discussion concerning the ongoing work in P1547.6, it was decided to not pursue any work on C37.108 at this time. The task force did feel that it should wait to see the results of P1547.6 and will take up any revision at a later date. The next revisit to the guide will probably be in 2010. Thus it was decided that the task force disband until a later date.

K3: Reducing Outages Through Improved Protection And Auto restoration In Distribution Substations

Chair: Bruce Pickett

Vice Chair: Tarlochan Sidhu

Established, 2002

Output: Paper

Expected Completion date: September 2008

Draft 11

Meeting was called to order with 6 members and 4 guests.

Discussed Draft 12.1

The last change of figure 5 and section 4 that had been approved at the previous meeting was incorporated into the new draft was discussed and one additional minor spelling change was made making the paper **Draft 12.2.**

Item 2 – Finalize

The paper will be sent out to all members for WG email vote- approve, approve with comments, or disapprove with a two week window for action. In parallel, Tarlochan is finalizing the Transactions Summary Paper. As soon as that is finished, and he is estimating within a month, then that will be sent out WG email vote.

Once WG vote is finalized on both, then will be submitted to the Subcommittee.

K4: (PC 37.95.2002): GUIDE FOR PROTECTION CONSUMER UTILITY INTERFACE

Chair: Mukesh Nagpal

Vice Chair: Chuck Mozina

Established, 2009

Output: Consider revision to guide

Expected Completion Date: 2012

The Working Group met in double session for its second meeting with 10 members and 20 guests.

- The chair discussed the scope of the guide and clarified that the guide addresses customers interconnected to utility transmission or subtransmission systems.
- Chuck Mozina has agreed to be the Working Group Vice Chair
- The chair will apply for a PAR to revise/update the guide
- A series of presentations were made at the meeting that discussed utility experience with interconnecting customers to their transmission or subtransmission systems.

1. Frank Plumtre – *Customer Interconnections Utility Perspective.*

2. Mukesh Nagpal - *Protection and System Considerations of Customers with Large Induction Motor Loads.*
3. Randy Crellin – *Large Induction Motor Backfeed for Utility System Faults.*
4. Simon Chano – *Operating Experience with HV Delta Connected Customers*

- The chair asked that if other utilities would like to make presentations at the next Working Group meeting on their experiences with interconnection of customer to their system. Such presentation can be schedule by contacting him.
- The chairmen asked Working Group members to review the guide to see what sections they my want to address. The chairman will provide copies of the exiting guide to Working Group members that do not have a copy of the guide.
- Chuck Mozina, Steve Conrad, Mike Bloder, Sukumar Brama, Jose Bregalda and Gabriel Benmouyal joined the Working Group.

K5: APPLICATION OF COMMON PROTECTIVE FUNCTIONS IN MULTI-FUNCTION RELAYS

Chair: Simon Chano

Vice Chair: Dean Miller

Established, 2005

Output: Report to the PSRC

Expected completion date: Early 2009

Draft 4

Working Group K5 met in a single session on Tuesday, January 13, 2009 in Atlanta with 9 members and 16 guests.

The changes to the report that were included in draft 7.1 were discussed. As a result of the discussion the following actions are to be taken:

1. Clause 2.1 “Protection Concepts” will be revised
2. A conclusion clause will be written.
3. References to C37.104 and 61850 will be added.
4. Annex 5 will be reviewed.

All of the writing assignments are due by January 30.

The plan is to email draft 8 of the report to the working group members for balloting. After the results of the Working Group’s review have been dealt with the report will be submitted to the subcommittee for review.

The team working on a summary paper is to have their writing assignments completed by April 1.

K6: Sudden Pressure Protection for Transformers

Chair: Randy Crellin

Vice Chair: Bill Gordon

Established: May 2005

Output: Report

Expected Completion Date: May 2009

Draft 2.0

Assignment: To complete a technical report to the Substation Protection Subcommittee on the application of sudden pressure relaying in power transformers.

The working group met on Wednesday morning, January 14th, in a single session with five members and no guests. The working group currently has 20 members.

After introductions and approval of the previous meeting minutes, the working group focused primarily on reviewing and making final comments to the survey document that Gene Henneberg had prepared. We also decided to include in the survey the used of sudden pressure relays in reactors and phase shifting transformers.

Our current plans are to send a copy of the finalized survey document and invitation letter to the PSRC officers for approval by the middle of February. Send the survey request notices March 1st, with the survey period closing the end of April, organize the survey responses early May, and then meet to discuss during the May 13th meeting in Pittsburgh. We are still investigating the actual mechanics of the survey.

As previously identified, we have obtained the attendance and/or membership lists of the following individuals which we intend to email the survey request notices (utilities only):

- 2007 WPRC
- 2008 WPRC
- 2007 MIPSYCON
- 2008 Texas A&M
- 2008 Georgia Tech
- WECC Members
- PSRC Main Committee
- Place notice in Power System Protection Yahoo Users Group
- Place notice in PAC Magazine Website.

In an attempt to expedite and better coordinate the efforts of the working group, we have decided to setup monthly conference calls.

As a result of Bill Gordon taking a new position in his company and no longer being able to participate in the working group, Don Lukach has volunteered to be the Vice Chair.

K7: GUIDE FOR THE PROTECTION OF SHUNT REACTORS.

Chair: Kevin Stephan

Vice Chair: Pratap Mysore

Established, 1999

Output: Revision of ANSI/IEEE C37.109

Expected Completion date: 2006

Status: Published

Working Group K7 did not meet at this meeting. The Paper has been recirculated to subcommittee members for approval.

K8: GUIDE FOR THE PROTECTION OF SHUNT CAPACITORS

Chair: Pratap Mysore

Vice Chair: Arvind Chaudhary

Established, 2006

Output: Revision of IEEE C37.99

Expected Completion date: 2011

Status: Draft 1

WG-K8 met on January 14, 2009 in one session with fifteen out of twenty-six working group members and ten guests in attendance. September 2008 Meeting minutes were reviewed and approved. The Quorum

requirement of IEEE standard was met. Patent slides from IEEE were shown to the working group to comply with the IEEE policy.

The working group reviewed the submittals on filter banks by Russ Patterson. With the uniqueness of each filter design, it was suggested to select a most common filter design for discussion. Simon Chano explained that the filter discussed in the existing guide was a second harmonic filter and suggested to use a more common harmonic filter for the guide.

Action Item: Simon will send an example of odd Harmonic filter (description and protection) to Russ.

Russ Patterson's write up on SVCs was also reviewed. One of the suggestions was to review IEEE 1031 "guide for the functional specifications of Transmission static var compensators" and see whether this could be included as a reference.

Action Item: Russ – to check on the inclusion of this reference.

Clause 2- IEEE STD 525 and 1143 related to cables are not used in any other clause in the document.

Action Item: Jim O'Brien will review and see if references need to be added in the relevant section in clause-10.

Comments on the use of current limiting reactors referenced in clauses 6.1 and 10.5 of the draft were discussed. One of the suggestions to the proposed addition was to reword the statement as follows in Clause 6.1. Page 16, line 9-11: " Under a fault condition between the reactor and the capacitor bank, the capacitor bank breaker is subjected to transient recovery voltage that may exceed its capability to interrupt the fault. " It was also mentioned that the outrush is not an issue on the breakers or switches.

Notes on the discussions from Capacitor subcommittee members -

A task force is formed in the capacitor subcommittee to address effects of reactor sizing for capacitor switching.

Notes have been added in the draft version of C37.06 to address outrush conditions.

Alla Deronja reviewed clause 7- Introduction to Bank and system protection in the early 2007. Chair requested a second review by a member.

Action Item: Oscar Bolado will Review this section (clause-7) again.

Clause 8- Unbalance Relaying Methods: This is the major portion of the guide and Ilia Voloh is reviewing / updating this clause with assistance from John Appleyard. It was decided that this clause with tables and formula would be checked for accuracy and correctness. In order to provide simple examples with figures, one suggestion was to add an annex to the guide with figure and example of each type of bank. Discussions brought out that each user had recreated the excel spreadsheet or a MathCAD work sheet to make use of the equations in the guide.

One suggestion was to post the excel spreadsheets on the PSRC web site for users to download.

Action Item: Pratap will contact John Harder to get the XLS worksheets. He will also contact Matt Ceglia about posting the Excel spreadsheet on PSRC website.

Other action Items:

Sukumar Brahma and Greg Sessler will review Bibliography to make sure that they are referenced in the document.

Simon Chano, Ilia Voloh and Greg Sessler will work on examples of shunt capacitor bank protection settings that would be included in the annex E.

Pratap will send the setting examples used during the IEEE Tutorial at Texas A&M

Pratap to contact John Harder to make sure that the definitions are harmonized between various documents in IEEE.

Mohindar Sachdev has kindly agreed to help format the document to IEEE standards requirement.

Outstanding Items:

- Charlie Sufana had agreed to provide an explanation on the statement on the unbalance voltage as three times the value obtained in the method shown in 12(b)

Bogdan, Pratap and Arvind to provide write up on modern protection methods not covered in the guide.

Please note that all assignments are due by Friday, Feb 27, 2009

Russ Patterson gave a presentation on " Bridge Capacitor Banks" . He will be submitting a write up to be added in the Bank configuration section of the guide.

Demetrios indicated that he would review Clause 8 and send in his comments.

Other items:

Pratap Mysore and Arvind Chaudhary went through the negative ballot comments – Most of them are addressed except for comments on the use of current limiting reactors. Pratap met with John Harder before the September meeting to review the negative comments and also to get his suggestions on the revision of the guide. Here are few points:

Unfused banks: . John felt that the discussions on the unfused banks need to stay in the guide as there are many installations in service though this is not supplied by the manufacturer. Negative ballot comments were reviewed. The suggested changes will be incorporated in the next draft.

K9: Protection Considerations to Mitigate Arc Flash Hazards

Chair: Karl Zimmerman

Vice Chair: Roger Hedding

Established: 2005

Output: Technical report to Substation Protection Subcommittee

Expected Completion Date: December 2008

Draft 5

The working group met with 5 members and 15 guests.

The report was sent out for comments by the Subcommittee Chairman in November. The possible responses were: Approved, Approved with Comments, or Disapproved with Comments.

We are pleased to announce that no disapproved responses were received. There were several Approved with Comments responses. For the most part, these comments were incorporated. We will post the final paper online shortly.

The final draft will be made available on the PSRC website within the next few days.

The Working Group expressed a willingness to offer the paper to technical conferences. Several members expressed a willingness to present the paper, if needed.

We hereby request that the WG be disbanded with thanks to all of the members, guests and anyone who reviewed and commented on the paper. There is widespread consensus that the paper is an excellent and helpful resource.

Even with the completion of the working group activities, the topic still has high interest. There was lively discussion on the merits of the various techniques for calculating arc incident energy and the related standards and software programs. It may be desirable for the Substation Subcommittee to coordinate with some existing organizations to monitor activities and ways it may impact PSRC.

K10: SCC21 DISTRIBUTED RESOURCES STANDARD COORDINATION

Chair: Gerald Johnson

Vice Chair: TBA

Established, 1999

Output: Standard through the SCC 21

Expected Completion Date: 200x

K10--SCC21 Distributed Resources Standard Coordination working group met Jan 13, 2008 with 5-members and 1-guest. IEEE 1547 working groups have not met since the Sept PSRC meeting, so there were only a couple things to pass on to the group. P1547.2 which is the application guide for the 1547 standard has been approved by the board and will be available for purchase as soon as the board gets it into print.

Also, a new working group P1547.7 has been formed and will meet for the first time at our Jan 27...30 meeting. P1547.7 will be a "Draft Guide to Conducting Distribution Impact Studies for Distributed Resource Interconnection". The Scope presently reads: "This guide describes criteria, scope, and extent for engineering studies of the impact on area electric power systems of a distributed resource or aggregate distributed resource interconnected to an area electric power distribution system." Chair plans to be a

member of this group and will report back at the next meeting unless something comes up that needs immediate input from the PSRC.

Anyone who has special interest in the progress of a particular SCC21 working group or would like to provide input, let the chair know and he will make sure the information gets to the right place.

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

Chair: Frank Plumtre

Vice Chair: Dan Hamai

Established, 1999

Output: With the completion of the Guide the current project is a transaction paper

Expected Completion Date: Summary Paper by mid 2008

The WG did not meet. A continued effort is needed on the summary paper. Per direction from PSRC officers it is acceptable to produce a conference paper i.e.: a document that can be presented at one of the three major relay conferences. Simon Chano and Frank Plumtre will head up this effort, with a plan for completion prior to the May PSRC meeting

K14: (PC 37.234): GUIDE FOR PROTECTIVE RELAY APPLICATION TO POWER SYSTEM BUSES

Chair: Bogdan Kasztenny

Vice Chair: Stephen Conrad

Established: May 2005

Output: Guide (PC37.234)

Expected Completion Date: 2008

Draft 7.01

The K14 Working Group met on January 14, 2009, in Atlanta, GA, with 23 members and 18 guests in double session. The minutes of the September 2009 were approved. The Chairman reminded about the IEEE intellectual property requirements.

Status of draft 8.06 has been reviewed. It was decided that this draft is a candidate for balloting after a dozen of technical issues are settled, and after some editing and formatting changes.

Draft 8.06 has been already submitted for the IEEE editorial review and feedback. It was decided the guide will stay with the "old" template as available at the beginning of the work, and will not switch to the latest available template.

It was decided that an invitation to form a balloting body would be sent out in January.

Subsequently discussion took place to make final recommendations on a number of technical issues identified prior to the meeting. In particular:

New section on CTs (clause 6.1) – sufficient? Yes, the present version is appropriate, no changes required.

New version of setting recommendations for differentially connected overcurrent schemes (clause 7.1.1.2) – sufficient? The term inverse-time will be detailed out to state "short-inverse" or "definite-time" type. John Burger suggested that example setting rules, such as from AEP, be added. John's previously submitted material will be re-circulated to the WG and a consensus decision will be made to resolve the proposal. If included, the extra material will become an informative annex.

Use of auxiliary CTs (clause 8.4) – discourage strongly or be more agreeable on allowing them? Not an issue with new relays, legacy installations are what they are and work fine, the Guide does not offer much help, refers to app notes from relay manufacturers. The clause is good as is; wording will be changed to state that modern relays eliminated the need for aux CTs to match ratios in most cases.

Automatic re-closing after bus faults (clause 8.7) – how much approval should the Guide yield for this? The clause is good as is.

Shorting the resistor/MOV in the high-impedance schemes by the 86 contact vs rating the resistor and MOV to withstand thermally the worst-case fault clearing time (clause 7.1.2.3). Safety, reliability. Currently all

figures show the 86 contact suggesting this is the preferred method. The clause is good as is; wording will be change to make it clear that that shorting contacts can be 86 or an internal aux relay.

Usage of SCR to control over-voltage in high-impedance schemes (7.1.2.3). Is this method still in use? Should the Guide mention it? The clause is good as is.

Location of the summing junction for high-impedance schemes in the yard (7.1.2.3) – how strongly should the Guide recommend it vs control house location? The clause is good as is. Re-word “recommended” to “beneficial”.

Use of ANSI device numbers for elements of high impedance schemes – see Figure 7.7 for example: 87 to signify the entire circuitry, but 59 and/or 50 when explaining its components? Approved.

Section on Breaker Substitution (8.14) – stand alone or part of informative Annex B (sample logic for reconfigurable buses)? Leave as is.

Breaker Failure Considerations (8.17) – stand alone close or merged into Backup Protection (8.18)? Leave as is.

Inrush current from grounding transformers directly connected to the bus (8.3) – is it a problem for the method removing I0 from the ground connection from each phase of the bus differential scheme? Approved – words will be added that higher pickup would ensure security too not only harmonic inhibit.

Annex B – double-bus single-breaker only or main-transfer bus configuration as well? Leave as is, double-bus single-breaker only.

Clause 8.12.3 Bus coupler considerations, Fig.8-13c [If Fig. C is used, you have an additional alternative. The scheme described, above the Figure, gives you selectivity for faults inside the bus coupler zone; but, with the penalty of delayed clearing. Alternatively, you do not need to rely upon sequential tripping caused by dynamically removing the CTs after the bus coupler opens. If you have a true bus coupler differential zone, you can trip both buses high speed for faults in this zone. The trade off is loss of selectivity for this small exposure but all bus faults are cleared high-speed. Some applications may prefer that solution.] Agreed – Mike Thompson to add a paragraph or so to the existing material.

Clause 8.13 CT column ground fault protection, paragraph “A free-standing column CT can be constructed with the cores either in the head or in the base. When the cores are located in the head, the CT may be referred to as a “head” or “top core” design [B-15]. In this case, the high voltage primary connection is made at the top and passes straight through the CT cores with only the secondary CT leads going down the insulation tube to the connection box at the base. This keeps all the primary connections in the head and makes an internal ground fault unlikely”, comment – I do not agree with this statement. The CT core shroud is grounded. It is easily possible for the insulation to fail between the live parts and the CT core shroud. It is no different. Either you take ground to the top or primary voltage to the bottom. It is true that it is apparently easier to manage electrical stress and build a capacitive graded insulation around the CT core shroud than to insulate the hairpin primary conductor. Jim O’Brian will re-word the material to accommodate this comment.

Clause 8.18.2 Remote backup protection, paragraph “At least relays on major current contributing circuits should be able to operate under the infeed effect. Once these contributors are disconnected, the degree of the infeed effect is reduced allowing other lines to be tripped sequentially. Sequential tripping may be considered a better solution compared with too generous increase in the zone reach that might jeopardize loadability of the lines”, comment – I do not think “infeed effect” is the accurate term. Infeed has no affect on the ability of remote overreaching elements to see the bus since all of the other branch circuits terminate at the point of the fault also. There is no shared network path that leads to infeed effect. A more accurate description of what is being described here is current redistribution leading to sequential tripping. However, no network element protection system should be unable to see an end zone fault in its protected zone which will be the same as a bus fault. The cases where end zone faults are tripped sequentially usually arise from three terminal lines. In that case, infeed effect is indeed a factor. I suggest that this paragraph either be removed, or elaborated to discuss what it really means. As written, it is not accurate and it is misleading. This item will be resolved via email and teleconferences.

Annex A High impedance bus differential example – multiple merit comments from Mike Thompson. Note – the Annex is not normative. The WG agreed to remove the nuances regarding sensitivity calculations, add a discussions regarding intentionally reduced sensitivity to cope with VT inrush or station aux power transformers tapped to a bus. Mike Thompson will suggest changes to clause 7 and Annex A.

The editorial changes and additions are due back by January 31.

Comments to draft 8.06 will be accepted till March 1. Preferred method is to download the MS Word document from the K14 web page, and insert changes under revision tracking.

A ballot candidate draft will be ready by March 12. WG vote will take place via e-mail during the week of March 16 whether to release the document for balloting.

For the next meeting, single session with a computer projector for 40 people. We kindly request avoiding conflicts with H11 and K8.

Liaison Reports:

Nothing to report

Old Business:

Nothing to report

New Business:

Working group chairs and vice chairs associated with standards development activity can get free access to IEEE-SA Standards Definitions Database. Please contact Matt Ceglia.

K subcommittee approved two new task forces:

KTF4: K Subcommittee approved the formation of a task force to continue coordinating work between the T & D Capacitor sub-committee and K13 the WG group which produced the guide on Protection of Series Capacitors. Specifically, the task force will meet with T & D Capacitor sub-committee members in May to jointly prepare a PAR to issue a corrigendum to the guide. The corrigendum will address errors in the existing document in particular, those dealing with potential safety issues. For reference, see minutes of joint meeting between T & D Capacitor Sub Committee and PSRC Stations Protection Sub Committee. Simon Chano will head the task force.

KTF9: "A new task force, KTF9 headed by Karl Zimmerman (note his original WG K9 has been disbanded) will meet in May in a single session (10-15 members wit AV), to determine future liaison efforts with respect to emerging and changing standards on arc flash. Broadly, liaison could consist of one of the following two efforts.

- Appoint a liaison to K sub committee to report on arc flash activities
- Appoint a WG (similar to K10 SCC21 Distributed Resources Standard Coordination)

Liaison: Vittal Rebbapragada has agreed to report activities of standards development in the T&D capacitor subcommittee to the K subcommittee working groups associated with series and shunt capacitor protection.

Joint Meeting T & D Capacitor Sub Committee and PSRC Stations Protection Sub Committee – A joint meeting of the T & D Capacitor Sub Committee and PSRC Stations Protection Sub Committee was held on Tuesday January 13 with several members of both committees in attendance. A short presentation was made by Simon Chano explaining the need to provide summary descriptions on major equipment aspects in Protection Guides and standards. After discussion amongst all attending it was agreed that:

Step 1 – a task force be formed, jointly with T & D Capacitors Sub Committee to continue coordinating work between the T & D Capacitor sub-committee and K13 the WG group which produced the guide on Protection of Series Capacitors.

Specifically, the task force will meet, with T & D Capacitor sub-committee members in attendance, in May to jointly prepare a PAR to issue a corrigendum to the guide. The corrigendum will address errors in the existing document in particular, those dealing with potential safety issues.

Step 2 – Upon completion of Step 1 a joint WG with members of the Capacitor sub-committee and K sub Committee will be formed (initially as a task force) to jointly work on providing a revision of the existing Guide on Protection of Series Capacitors

Refer to subsequent PSRC 'K' sub committee meeting minutes for KTF4 where it was agreed that to form the task force.

VII PRESENTATIONS:

Our main committee meeting is greatly enhanced by presentation by our members of the outputs of the different working groups. We always appreciate their efforts. This time we had four interesting presentations.

- Distribution Protection Guide Phil Waudby
- File Naming Convention for Time Sequence Data Amir Makki
- Cold Load Pickup Issues and Protection Dean Miller
- IEEE/IEC Dual Logo status Jodi Hass

Future Meetings:

May 2009 – Pittsburgh, PA May 10-14th at the Doubletree on Bigelow Square.

Sept. 2009 – Arlington, TX (Dallas, TX area) Sheraton for Sept. 14-17, 2009

This will be the first meeting that will try the new format. The meeting will start as usual with the Monday evening reception and working groups on Tuesday morning. However, Wednesday will be all day of working groups, Thursday morning will be subcommittee meetings and Thursday afternoon will be the main committee meeting. Since this is near the Dallas-Fort Worth airport, many should be able to get flights out early evening.

May 2010 - Madison, WI (Madison Concourse Hotel) May 10-13, 2010. Same format as above.

September 2010 – Berkeley, CA (near San Francisco, CA) - Doubletree - Sept 13 -16, 2010.

The format will be that working group meetings start on Monday afternoon and we will finish with the Main Committee meeting on Thursday morning.

VIII. The meeting was adjourned by Chairperson Miriam Sanders