



POWER SYSTEM RELAYING COMMITTEE

OF THE

IEEE POWER ENGINEERING SOCIETY

MINUTES OF THE MEETING

May 12-15th, 2008

Kansas City, MO

Final

Power System Relaying Committee

Main Committee Meeting Agenda

May 15, 2008

Kansas City, MO

8:00 AM – 11:30 AM

- | | |
|--|-------------------------|
| I. Call to order / Introduction | Charlie Henville |
| II. Approval of Minutes/Financial Report | Bob Pettigrew |
| III. Reports of Interest | Charlie Henville |
| A. Technical Paper Coordinator's Report/Future Meetings | Miriam Sanders |
| B. PES Report- points of interest | Wanda Reeder |
| C. CIGRE Report | T. W. Cease |
| 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 | Mike Dood |
| J. NERC Report | Bob Cummings |
| K. Other Reports of Interest | |
| IV. Advisory Committee Reports | Charlie Henville |
| B1. Awards/ Recognition | Bob Beresh |
| V. Subcommittee Reports | Charlie Henville |
| C- System Protection | Rich Hunt |
| I - Relaying Practices | Tarlochan Sidhu |
| K - Substation Protection | Frank Plumptre |
| H - Relaying Communications | Alex Apostolov |
| D - Line Protection | Mike McDonald |
| J - Rotating Machinery | Wayne Hartmann |
| VI. Presentations | Bob Pettigrew |
| • Guide for Application of Protective Relays for Abnormal Frequency Load Shedding and Restoration | Alex Apostolov |
| • Rev. of Guide for Field Testing of Relay Current Transformers C57.13.1 | Don Sevcik |
| • Justifying Pilot Protection on Transmission Lines | Gary Kobet |
| VII. Adjourn | Charlie Henville |

I. Call to order / Introductions

Henville

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

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

Pettigrew

The minutes of the San Antonio (Jan. 2008) meeting were approved.

The Kansas City meeting had two meeting sponsors, WESTAR and Burns & McDonnell. We appreciate their support for this PSRC meeting. A brief financial summary was given. The PSRC was not involved financially with the joint PES meeting in San Antonio so we saw neither profit nor loss. The Kansas City meeting should show a profit due to the large attendance and cost controls.

III Chairman's Report

Henville

The PSRC is continuing to occupy a significant leadership role not only in power system protection, but in the wider scope of power system engineering in general. The Committee's success is quantified by the continued high attendance numbers at our meetings. At this meeting there are record numbers of attendees (more than 200) for a May meeting and this merely confirms the observations of record numbers at the last January and the last September meetings. The difficulties that some participants are meeting in lack of availability of hotel guest rooms, are because such increased attendance was not anticipated one and two years previously when the hotel contracts were negotiated.

In several cases, the quality of the work of our participants is not fully recognized by the grade of membership in the IEEE. Most people attending PSRC meetings have already achieved a level of contribution or responsibility in their profession that would qualify them for at least for senior membership, and in some cases for Fellow grade. The PSRC wants to have its participants achieve the status of membership for which they are qualified. Therefore all attendants are encouraged to at least consider whether they might be eligible for senior membership level.

A count of members present at the Main Committee was taken and a quorum was established. 70 members were present and this is more than the required number of 57 for a quorum.

The PSRC operating procedures require that the Chair, Vice Chair and Secretary terms are all two years long. The officer positions will be changing on 31 December 2008. The newly appointed Secretary starting January 1, 2009 is Roger Hedding.

Reports of Interest

A. Technical Paper Coordinator's Report – Sept. 2007

Sanders

The IEEE PES 2008 T&D Exposition in Chicago was held in Chicago in April. There were 19 papers and 1 Transaction Paper presented in the Tuesday afternoon poster session. I would like to thank Roger Hedding for monitoring the poster session.

The IEEE PES 2008 General Meeting in Pittsburgh is now available for registration. There were 42 papers and 4 transaction papers accepted for presentation. There is one regular paper session scheduled on Wednesday morning, one poster session on Monday evening and a new paper forum session scheduled for Monday afternoon. The paper forum is a hybrid session of the paper session and poster session, to allow authors to present the abstract of their paper in a formal session, and then have opportunity to discuss in detail to all interested parties. There will be 14 papers presented in this new session type.

Future Meetings

NOTE for September 2008 meeting. New passport requirements are in place now. Be sure you have an up-to-date passport. For those of you who have passports – be sure they are not expired!

January 2009 – will be joint with the other PES Technical Committees. Orlando, FL, the week of Jan 11-15, 2009. Hotel to be announced later.

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

B PES Report

Wanda Reeder

No Report submitted.

C. CIGRE B5 Activities Report

Cease

The 2007 Colloquium was held in Madrid Spain October 15-20, 2007.

At the Colloquium 4 new working groups were started. They are:

WG B5.38 The Impact of Implementing Security Requirements using IEC 61850,
WG B5.06 Maintenance Strategies for Digital SAS Systems,
WG B5.12 Engineering Guidelines for IEC 61850 Based Digital SAS, and
WG B5.14 Wide Area Protection & Control Technologies.

Anyone wishing to participate in any of these working groups please see me.

The 2008 session will be held in Paris August 24-29, 2008. The US has an allotment of 10 papers for all 16-study committees. Attached is a listing of the 10 papers accepted by CIGRE. In an effort to have more US papers included in the session several papers were recommended for the International category, in which the authors are from more than one country. Attached is a list of 8 papers that were accepted in that category. Don Russell created a category this year called Alternative Papers. He submitted 4 papers in that category and 3 were accepted. They are also included in the attached list.

The preferential subjects for the Paris session are:

PS1: Impact of Process-Bus (IEC61850-9-2) on Protection and Substation Automation Systems

- System reliability
- System architecture
- Experiences so far

PS2: Life Cycle Management of Protection and Control Systems

- System testing policies
- Testing of Protection and Substation Automation Systems
- Procedures, tools and experiences in Life Cycle Management
- Experiences/systems for remote maintenance

Study Committee B5 has a number of open working groups. Several of these working groups will close this year and new working groups will be formed at the Paris session. Anyone wishing to become involved in CIGRE work is invited to participate in these working groups as they are formed.

USNC Quota

1. J. L. Kirtley, Jr. – “Improving Efficiency of Induction Motors Using Die-cast Copper Squirrel Cages”
2. G. Gauger, G. Lemm, A. Martins, M. Rapp – “Mineral Oil with Corrosive Sulfur – Method Evaluation to Identify False Negatives and Its Performance with blends of Natural Ester”
3. P. Reichmeider, S. E. Jacobson, C. W. Devine, D. N. O’Connell, J. R. Wilson, J. R. Colson – “Experience with New Methods for Live-Line Conductor Replacement”
4. K. Kutlev, L. Tang, R. M. Reymers – “Complete Methodology for Selecting Optimal Substation Solutions”
5. M. Adamiak, B. Kasztenny, J. Mazzeuw, D. McGinn, S. Hodder – “Considerations for Process Bus Deployment in Real-World Protection and Control Systems: A Business Analysis”
6. S. Venkataraman, H. Elahi, E. Larsen, K. Schreder – “The Linden Variable Frequency Transformer Merchant Transmission Project”
7. K. Moslehi, R. Kumar, A. Bose, C. Gelling – “Smart Infrastructure for a Self-Healing Power Grid — Concepts for Coordinated Intelligent Control”
8. J. C. Smith, M. Ahlstrom, R. M. Zavadil, B. Oakleaf, T. Godart – “The Role of Wind Forecasting in Utility System Operation”
9. L. Ott – “Implementation of Demand Response in the PJM Synchronized Reserve Market”

10. S. Chuang, C. W. Gellings – “Demand-side Integration in a Restructured Electric Power Industry”

International Quota papers

1. D. Lindsay, M. Roden, D. Willen, A. Keri, B. Mehraban – “Operating Experience of 13.2 kV Superconducting Cable System at AEP Bixby Station”
2. L. O. Barthold, D. E. Douglass, D. A. Woodford – “Maximizing the Capability of Existing EHV Transmission Lines “
3. J. Phillips, C. Engelbrecht – “The feasibility of using daytime corona inspection to identify contaminated insulators that needs to be washed”
4. R. Adapa, S. Maruvada, M. Rashwan, N. Hingorani, M. Szchetman, R. Nayak – “R&D Needs for UHVDC at 800 kV and Above”
5. Apostolov, B. Bastigkeit – “Testing of Modern Bus Protection Systems”
6. Apostolov, B. Vandiver, D. Tholomier – “Testing of Distance Protection Relays”
7. O. Huet, J. Ph. Tavella, T. Coste, J. Hughes – “Reaching out Seamless and Cost-effective Automation beyond IEC 61850”
8. X. Wang, H. Hamadani, K. Morison, A. Moshref, A. Edris, C. Bridenbaugh – “Systematic Approach for Identification of Voltage Collapse Areas and the Reactive Power Reserve Requirements in Large Interconnected Transmission Grids”

USNC Quota alternative papers submitted

1. M. Begovic, N. Hampton, R. Hartlein, J. Perkel –“Validation of the accuracy of practical diagnostic tests for power equipment”
2. T. Witham – “Secure Substation Networks: Implement for Today; Design for Tomorrow”
3. L. Kojovic – “Innovative Non-conventional Current Transformers for Advanced Substation Designs and Improved Power System Performance”

D. UCAIug Report

Burger

No Report

E. EPRI Report

Hughes

No Report.

F. IAS Power System Protection Committee

Mozina

The IAS items of interest to the PSRC:

- **Color Book Reorganization** – A major restructuring of the Color Book series was kicked off at the I&CPS (Industrial and Commercial Power System) Department meeting May 4-8 in Clearwater, FL. The restructuring will eliminate the Color Books, as they now exist. The 13 color books are to be divided into over 100 standards documents that will be sold individually by the IEEE. Material that appears in a number of color books will be combined. Major area of interest for the PSRC is the medium voltage protection material in the old 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 set of 13 individual standards each of which will be assigned a PAR. Three sections in each of the olds Colored books were choice as trail standards to try out the new system.
- **Generator Grounding and Ground Fault Protection WG** – This WG is investigating potential transient overvoltages associated with hybrid generator grounding. Hybrid grounding is a method used to reduce the ground current for internal generator stator ground faults on industrial generators that are typically low resistance grounded. 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. It also defined the equipment requirements for hybrid grounding. At the May Clearwater I&CPS meeting a WG reported on its finding was presented in a paper entitled, “*Grounding and Ground Fault Protection of Medium Voltage Industrial Generators.*” The 12 year old WG has produced 5 papers on the subject of generator grounding and will continue its effort concentrating on the system grounding issues at industrial facilities

with a paper entitled “*Optimum Grounding and Ground Fault Protection of Medium Voltage Industrial Systems with Multiple Ground Sources.*”

- **PSCR Paper Presented at IAS** -At the I&CPS meeting in Clearwater, FL Chuck Mozina presented the PSRC J-5 WG paper entitled: “Coordination of Generator Protection with Generator Excitation Control and Generator Capability.”

G. IEC Report

Udren

TC 95, Measuring Relays

The USNC Technical Advisory Group (WG I4) continues to evaluate and comment or vote on IEC 60255 Series measuring relay standards. In the case of equipment design and EMC standards, we have no US members of working groups that develop the standards, and thus limited influence. Documents we now respond to are:

95/225/CDV - IEC 60255-11 Ed.2: Measuring relays and protection equipment - Part 11: Voltage dips, short interruptions, variations and ripple on auxiliary power supply port -

The test suite now includes checks for a full range of auxiliary power supply quality problems and interruptions. Depending on the problem, the relay must ride through the disturbance with no functional impact, or temporarily cease operation and resume when the supply is restored. The WG decided to cast a favorable vote, with a request for declaration by manufacturers of how long “temporary” is (typically, relay reboot time).

95/231/CDV - Measuring relays and protection equipment - Part 1: Common requirements – Major differences from C37.90, and problems found. Vote in September – more review by July 21.

95/230/FDIS – IEC 60255-26, EMC Requirements

For RF immunity and ESD tests, IEC has less demanding compliance levels than IEEE C37.90.2 and .3. For RF, IEC requires 10 V/m modulated, while IEEE calls for 18 V/m modulated & 35 V/m unmodulated field strength. The IEC test is thus not a challenge for manufacturers testing to IEEE levels, and the US has consistently viewed it as inadequate and has voted negatively. We cast a vote against this final standard with explanation.

95/233/RVD on FDIS – IEC 60255-22-4, Fast Transient Test – We reviewed national committee comments on recent final draft, and only a few of over 40 US comments were accepted.

IEC functional standards are the one area where we are having successful exchange due to the role of Dr. Murty Yalla as Convenor for IEC TC 95 maintenance team 3 working on these:

Draft 60255-151 - Functional standard for over/under current protection. This is a new standard from TC 95 Maintenance Team 3 chaired by Dr. Murty Yalla. The new draft Standard absorbs, updates, and supersedes IEC 60255-3 and IEEE C37.112-1996. The first CD was reviewed by national committees, and the standard needs constants for reset timing of what used to be called IEC relay curves. This should be complete in 2008.

Draft 60255-127 - Functional standard for over/under voltage protection. This work by TC 95 MT4 is not yet ready for draft circulation, and is adding some application basis for inverse time curve shapes of voltage relays

Draft 60255-121 Functional standard for distance relays – draft still under development.

TC 57, Teleprotection and Power System Control

Christoph Brunner chairs TC 57 WG10 developing 61850. WG 10, 17, 18 are working on the following topics:

There are two working groups (WG17, WG18), that adopt IEC 61850 for applications other than substations. These working groups prepare the following documents:

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 61850-7-420: object models for distributed energy resources – this is planned to be circulated as FDIS in the middle of this year

Working group 10 prepares Edition 2 of IEC 61850. Edition 2 will incorporate many clarifications as well as new features used by other domains. Included will be models for power quality. Recently circulated 61850 Edition 2 documents include:

Part 7-1: Basic communication structure for substation and feeder equipment - Principles and models - Revision project initiated and CDV circulated with vote due in October.

Part 7-4: Basic communication structure - Compatible logical node classes and data classes – CDV with vote due in August.

Part 7-2: Basic information and communication structure - Abstract communication service interface (ACSI) – Comments on CD circulated; new CDV circulated with vote due in October.

Part 7-500 will explain the use of logical nodes defined in IEC 61850-7-4 to model applications of a substation automation system.

A task force of WG 10 is addressing the use of IEC 61850 for communication between substations. One typical application is the communication used between two distance protection relays to implement the different teleprotection schemes. A draft report for comment is being circulated as IEC 61850-90-1. Within the report, topics addressed are the communication architecture, the IEC 61850 modeling of the teleprotection equipment, and the impact on the configuration using IEC 61850-6 system configuration language.

Another task force of WG10 is addressing the mapping of IEC 61850 on IEC 60870-5-101 /-104 as it is used in a gateway between a substation using IEC 61850 and the communication with a control center using 60870-5-101 /-104. A draft technical specification has been circulated.

A task force of WG19 is addressing the issue of using IEC 61850 for communication between substation and other field devices to control centers. It is planned to circulate a report IEC 61850-90-2 later this year. This must also be harmonized with CIM.

H. Standard Coordinators Report

Gilbert

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 May 13, 2008, in the Grand ABC room of the Kansas City Marriott Country Club Plaza. Lisa Perry, IEEE Standards Project Editor, answered questions concerning editing of standards.

Jennie Steinhagen, Program Manager, Document Development IEEE Standards Activities, and Lisa Perry spoke about the IEEE-SA Word template and answered questions in an afternoon session held at 1:30 PM.

The status of PARs is summarized below. The actions to be taken for keeping PAR approvals up-to-date and for keeping Standards and Guides alive are identified. A summary of the specific approvals received, since the January, 2008 meeting of the PSRC, is identified as well.

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.

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Important Information

A new set of Patent Slides has been developed 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>

Standards Coordination Effort

PARs applied for by all Committees of the Power Engineering Society (PES) are listed in the NESCOM meeting minutes. The March 26, 2008 meeting minutes included a PAR request submitted by the IEEE PES Transmission and Distribution Committee:

P1782 "Guide for Collecting, Categorizing and Utilization of Information Related to Electric Power Distribution Interruption Events."

This PAR request was tabled to a future meeting due to a lack of response. If you are interested in this development work, contact the Chairman or Secretary of the Transmission and Distribution Committee.

Standards Activities Since The January, 2008 Meeting

The status of the standards activities, which have taken place since the May, 2007, meeting of the PSRC, are as follows.

1. Standards Published

C37.230 Guide for Protective Relay Applications to Distribution Lines

C37.235 Guide for the Application of Rogowski Coils used for Protective Relaying

2. Standards waiting to be Published

C37.91 IEEE Guide for Protective Relay Applications to Power Transformers

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

3. Standards Reaffirmed

C37.94 IEEE Standard for N Times 64 Kilobit Per Second Optical Fiber Interfaces Between Teleprotection and Multiplexer Equipment

C37.104 IEEE Guide for Automatic Reclosing of Line Circuit Breakers for AC Distribution and Transmission Lines

4. Standards submitted for reaffirmation

C37.94 IEEE Standard for N Times 64 Kilobit Per Second Optical Fiber Interfaces Between Teleprotection and Multiplexer Equipment

C37.104 IEEE Guide for Automatic Reclosing of Line Circuit Breakers for AC Distribution and Transmission Lines

5. Standards approved

C37.91 IEEE Guide for Protective Relay Applications to Power Transformers

6. Standards submitted for approval

None

7. Standards to be submitted for approval

None

8. Submitted for Balloting/ Recirculation

C37.94 IEEE Standard for N Times 64 Kilobit Per Second Optical Fiber Interfaces Between Teleprotection and Multiplexer Equipment

9. Standards Balloted

None

10. Standards Re-circulated

C37.94 IEEE Standard for N Times 64 Kilobit Per Second Optical Fiber Interfaces Between Teleprotection and Multiplexer Equipment

C37.104 IEEE Guide for Automatic Reclosing of Line Circuit Breakers for AC Distribution and Transmission Lines

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

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

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

PC37.98 Standard Seismic Testing of Relays

15. New PARs approved

PC37.90.1 Standard Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus

PC37.98 Standard Seismic Testing of Relays

PC37.118 Standard for Synchrophasors for Power Systems

16. PAR Extensions applied for

None

17. PAR Extensions approved

None

18. Modified PAR approved

None

19. Modified PAR Submitted

PC37.98 Standard Seismic Testing of Relays

20. PARs Withdrawn

None

21. PARs expiring at the end of 2008

None

SUBMITTAL DEADLINES & STANDARDS BOARD MEETING SCHEDULE

PAR/Standard Submittal Deadline Standards Board Meeting

May 2, 2008 June 4, 2008

August 15, 2008 September 24, 2008

October 20, 2008 December 8, 2008

I. Substation Committee Report

Dood

No Report

J. NERC Report

Cummings

(Jim Ingleson provided the following report)

1. PRC-023 will be filed with FERC, for approval, however this has been delayed. (This actually took place on July 30, 2008.)
2. A revision to the Disturbance Monitoring Equipment Standards (PRC-002 and PRC-018) will be posted this summer, for comment only.
3. SPCTF is working on future standards including Protection Redundancy (renamed Protection Reliability), and Generator Protection.

IV. B. ADVISORY COMMITTEE REPORTS

Henville

Chair: Charlie Henville
Vice Chair: Miriam Sanders

B1: Awards and Technical Paper Recognition

Chair: Bob Beresh
Vice Chair: Solveig Ward

The group met on Tuesday May 13th.

The question of service awards was again discussed and how often they should be passed out. It was agreed that service awards should be passed out at each PSRC meeting until we are caught-up. Service awards will be given out at 5 year service intervals beginning with the 15th year.

Two special awards, the “distinguished service award” and the “career service award” were also discussed and several names were suggested as recipients. These will be formally presented to the executive committee for approval and awards will be distributed at the Sept meeting in Vancouver.

Bob Beresh will discuss with Bob Pettigrew about the logistics of the financial matters dealing with Canadian and US border issues regarding award shipping and payments for awards.

Certificates of Appreciation were handed out to: Tony Seegers – SC Chair System Protection, Roger Hedding – SC Chair Line Protection, Eric Udren: Chair WG I5, Mike McDonald: Chair WG D6. 19 Service Awards were handed out for those with years of service from 17 through 26.

B2: Fellows Awards

Chair: J.S. Thorp

No Report

B3: Membership Committee

Chair: M.J. Swanson

Attendance during the PSRC meeting was approximately 201. This is considered excellent for a May meeting.

18 new attendees were in our Newcomers Orientation meeting on Tuesday, which is considered excellent participation. Two attendees returned after a year's absence. I contributed to the presentation.

No management support letters were written.

9 Service Awards were presented on Thursday.

B4: O & P Manual and WG Training

Chair: R. Hedding

No working group chair training session was held.

A proposed revision of the O&P manual was reviewed to include the necessity of having a quorum at meetings where Standards are discussed. The revised O&P Manual will be sent to the appropriate authorities for approval.

B5: Bibliography and Publicity

Chair: T.S. Sidhu

Vice Chair: M. Nagpal

The WG met on May 13, 2008 with six members and one guest in attendance. The Chair indicated that the first draft of the 2007 bibliography paper is ready and the entire paper should be ready within two months. Mal Swanson will work with the PSRC Chairman to assist in preparation of the publicity report. There have been no NERC reports to review. WG Chair has provided more than 70 years of bibliography (in word files) to PSRC webmaster (Russ Patterson) for possible creation of a searchable database and this possibility is being investigated with the help of Alex Apostolov.

B8: Long Range Planning

Chair: Phil Winston

The PES requested that PSRC elect a representative to serve on a committee to analyze the structure of the PES Committees to see if the organization can be improved by realigning or combining committees. The Long Range TF discussed this issue and felt that our interests could be best served by nominating Stan Horowitz to this position. Stan agreed to serve and he accepted the nomination. No further actions were taken.

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, May 14th, 2008, in Kansas City, MO, with 16 members and 34 guests in attendance.

7 Working Groups and 1 Task Force met at this meeting. The members of the Subcommittee approved the minutes of the January 2008 meeting.

The Subcommittee approved the formation of Working Group C16, Relay Scheme Circuit Design Using Microprocessor Relays. The WG Chair will be Ken Birt, Vice Chair Raluca Lasca, and will produce a report to the Main Committee.

PSCE liaison report: nothing to report.

PSSC liaison report: Nothing to report.

Cyber Security: The C Subcommittee chair had agreed with the H Subcommittee chair that the HTF3 Task Force should remain in H.

CTF15; Testing and design of system integrity schemes, will become WG C15. It will be temporarily chaired by Yi Hu.

A new Task Force was formed, CTF17: Wind farm modeling for protection coordination. Dean Miller will chair the Task Force.

The PES Wind Power Coordinating Council is starting a Task Force and asked for input from PSRC. This Task Force is meeting for the first time at the General Meeting in Pittsburgh. Charlie Henville volunteered to serve as a liaison for that meeting.

Wind farm modeling for protection coordination on the transmission system is of interest for PSRC. The induction machines used for wind farms do not have a well defined short-circuit performance for transmission system faults.

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

Summary Meeting Notes:

WG C-4 met on May 13 in one session with total 19 in attendance (10 M, 9 G).

WG members are in the process of tabulating over 60 responses to the SIPS questionnaire received so far, covering several hundred schemes. The spreadsheet tabulation of approximately 50% of the responses received was reviewed and discussed. Vahid indicated that the task of tabulating requires consistent interpretation and is done by Frankie Au-Yeung, Victor Ortiz, and Vahid Madani. Vahid then presented some of the statistical data in plot format about types and reliability of the reported SIPS systems.

Some of the recent responses have arrived from across the globe, but there are notable absences of information from countries such as China, Russia, Australia, etc. The members are trying to disseminate information about questionnaire and promote geographically wide spread responses.

John Sykes pointed out that the wide diversity of potential survey users will benefit from knowing geographic sources of the presented information, although someone remarked that the anonymity in responses may encourage certain respondents to send information which they otherwise would not. Vahid highlighted that none of the plots that were discussed / presented focused on the name of the respective company, but it is valid that information is traceable.

There was also some discussion about the on-going process of data presentation, contained in an elaborate spreadsheet, and different visual ways of presenting (sometimes very information-rich) data sets.

Stan Horowitz proposed a tentative outline of the report, and there was discussion about the initial assignments. Main parts of the report will be an introductory part (to include a discussion about the types of SIPS, architectures, etc.) which will be coordinated by Eric Udren and John Sykes, and another part, containing various statistical data, geographic coverage data, classification of various reported applications as well as information about different engineering approaches and design considerations, which will be coordinated by Damir Novosel, Miroslav Begovic and Vahid Madani. For that purpose, an earlier paper produced for IREP 2007 conference to promote survey responses will be used as an initial template for that section of the report.

We are still receiving responses to the survey if anyone is interested.

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

WG C9 met in May in a single session. The WG discussed the progress of the summary transactions paper.

The group plans to meet for the last in September 2008 to finish the presentation.

Meeting room requirements for May are: 30 people, power strip, projector, single session.

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 May 13 in a single session with total 30 in attendance (15 M, 15 G). After review of the patent slides, the WG members reviewed comments from multiple reviewers followed by edited contributions based on reviewer's suggestions.

A brief section has been suggested to reflect the appropriate NERC PRC related information – primarily as reference material. The WG members agree the Guide should provide informative references.

The WG members have been encouraged to submit any final comments as the WG members are finalizing the Guide by mid June and start the process for forming the balloting body and official process for review by the IEEE.

The plan is to release the latest version by mid to end of June 2008 to the C Subcommittee. Members of the C subcommittee are part of the balloting body and will have an opportunity to further comment on the draft Guide during the balloting open period.

Suggestion was made to send a reminder to the C subcommittee members to encourage the Subcommittee members to join the balloting pool.

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 met in a single session chaired by Damir Novosel on May 13, 2008 with 13 members and 18 guests present.

Prior to the meeting, the Working Group final report had been reviewed by the Working Group membership, and sent to the C Subcommittee for approval. The subcommittee subsequently reviewed, voted upon and approved the report with only editorial comments.

Damir thanked the Working Group members for their contributions and read several responses from Subcommittee members that congratulated the Working Group for producing a comprehensive and well organized report.

Comments received from Charlie Henville were discussed. Charlie suggested that, because of the length of the paper, a summary paper should be prepared. The Working Group agreed that this was necessary. Charlie also noted that the word "recommended" appears in the report several times and that, since this is not a Standard or Recommended Practice, the use of this word is not appropriate. The report was reviewed and suggestions were made for replacement or removal of the word "recommended" in six places. Charlie also noted that in several places in the report, out-of-step blocking of trip functions is indicated without mention of the need to also implement out-of-step tripping. After discussion and a search of the document, it was agreed to correct this terminology in sections 3.2.1 and 3.2.6.

Charlie suggested that a qualifier should be added to the sentence in Section 5.4.1 on the setting drift of generator excitation system protection devices to indicate that this applies to non-numerical relays only. This suggestion was accepted.

Because of the nature of the corrections made to the report, it was agreed that re-balloting by the Subcommittee would not be necessary.

The Working Group members agreed that the report should be submitted for presentation at the three major US relay conferences. Report abstracts will be prepared and submitted as follows:

- Georgia Tech Relay Conference - Miroslav Begovic
- Texas A&M Relay Conference - Solveig Ward
- Western Protective Relay Conference - Alex Apostolov

Damir will create an outline for the IEEE Summary Paper. The paper will be prepared by Miroslav Begovic, Solveig Ward, Alex Apostolov, Arvind Chaudhary and George Bartok. This paper will be submitted to the C Subcommittee for approval prior to publication.

Damir will also prepare a two-page summary of the paper for publication in the PAC World magazine. For the next meeting, a single session to review the Summary Paper for 15 people with a computer projector will be required.

C13: Undervoltage Load Shedding

Chair: M. Begovic

Vice-Chair: S. Imai

Output: IEEE Report

Established: September 2005

Expected Completion Date: January 2009

The UVLS Working Group met on January 9 with 19 in attendance. Upon introductions and approval of the January 2008 minutes, an overview of Draft 4.1 was done and assignments made for final contributions and editing of the report. The meeting was attended by 10 members and 9 guests.

Discussions on the latest draft (4.1)

1. References need to be added to Section 3.1.3 (Charlie Henville)

2. References need to be added to Section 5.1.1 (Richard Young)
3. Text on centralized schemes for Section 5.2.1 will be solicited (from Steve Conrad, or Jean-Marie Gagnon)
4. Text on distributed schemes for Section 5.2.1 will be added (by John Burger)
5. Text on Centralized / Wide Area UVLS for Section 5.2.2 will be added (by Shinichi Imai, possibly also by Ken Martin)
6. Text on Voltage Slide Scheme for Section 6.1.1 will be added (by Harley, to be sent by Cunico)
7. References for Section 7.6.1 will be added (by Vahid Madani)
8. Text on Coordination UVLS – UFLS will be added (by John Burger)
9. Text on Maintenance / Testing / Reliability will be expanded using CIGRE “Defense Plan” report as a template (by Vahid Madani, Miroslav Begovic)
10. References to the names of companies and specific products will be removed from the report (Shinichi Imai, Miroslav Begovic)
11. Sections 9 and 10 will be moved into the Appendix of the report
12. Text on 1987 voltage collapse in France is needed (Miroslav will try to contact Daniel Karlsson)
13. Editors have been assigned to read the text of the entire report (Miroslav Begovic, Shinichi Imai, Damir Novosel, Vahid Madani, Ken Birt, Alex Apostolov, George Nail)

Timeline of the activities

- May 31, 2008 – All contributions received
- June 15, 2008 – Report sent to the reviewers
- July 31, 2008 – All reviews due to Miroslav and Shinichi
- August 15, 2008 – report sent to the members

We request a projector and a room for 30 people at the next meeting. At this time, we request a time allotment for a single session.

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 May 13, 2008, in Kansas City, MO, in a single session chaired by Jim O'Brien with 17 members and 28 guests.

Two presentations were given at the meeting. Miroslav Begovic presented “Voltage Instability Predictor”. Alla Deronja gave a presentation “Predictive Out-of-Step Protection and Control Scheme Based on Real-Time Phasor Measurement Application”.

The chair distributed the updated draft of the proposed outline, which was discussed by the group, and a few additional topics were brought up.

Line current differential protection was proposed to be included in the Present Applications section as it can be implemented with time-stamped synchrophasors for multi-terminal lines.

A potential application of generator loss of field protection applied with synchrophasors, which could calculate in real time the reactive power of the machine, was proposed for the Future Applications section.

Another application was proposed dealing with power plant operator response via a real-time alarm based on synchrophasor measurements for loss of one of the transmission lines connecting a plant to a transmission system.

If other members desire to volunteer for writing assignments for topics presented in the outline, they are encouraged to contact the group chair.

Requirements for the next meeting are as follows: single session, meeting room for 45 people with a computer projector.

C16: Relay Scheme Design for Modern Relays

Chair: K. Birt

Vice-Chair: R. Lascu

Output: IEEE report

Established: May 2008

Expected Completion Date: 2010

C16, Relay Scheme Design for Modern Relays, met for the first time on Tuesday, May 14, 2008. There were 40 people in attendance.

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

A preliminary copy of the outline was discussed. Topics to be included in the outline were evaluated. It was proposed to have presentations on the original 1999 relay trip design paper, at the next meeting. Jurgen Holbach volunteered for the presentation. Kevin Donahoe, Jay Sperl and Ken Birt volunteered to further revise the outline.

If any members of the original working group are interested in participating in the presentation, or have information about this material please let Ken or Raluca know.

Requirements for the next meeting: single session, a room for 50 and computer projector.

Raluca Lascu vicechairman
lascu@dteenergy.com

Requirements for next meeting: 1 session, room size of 50, computer projector.

CTF15: Testing and Design of SIPS

Chair: Y. Hu

Vice-Chair: R. Cummings

The Task Force CTF-15 is met in May 2008 to define the scope and the product of this future working group. The Task Force suggested that the output will be a report.

Requirements for next meeting: 1 session, room size of 30, computer projector.

D: LINE PROTECTION SUBCOMMITTEE

Chair: M.J. McDonald

Vice Chair: Russ Patterson

The Subcommittee meeting was called to order at 3:00 pm on May 14, 2008 with 26 members and 19 guests.

- After introductions the chair had IEEE Senior and Fellow members stand up and encouraged the remaining attendees to apply for senior membership.
- The chair directed all working group chairmen to put in their minutes when their document had been approved by the subcommittee. This would be a trigger to the PSRC officers to review the document.
- After working group reports the January 2008 meeting minutes were approved.

Reports from the WG Chairs:

D1: Cold Load Pickup Issues and Protection

Chair: Dean Miller

Vice Chair: Tony Sleva

Output: Report to PSRC

Expected completion date: Completed

Working Group D1 did not meet in Kansas City.

The report was reviewed and approved with changes by the Line Subcommittee and the PSRC officers. The report was modified to satisfy the reviewers and submitted for posting on the PSRC web site.

The report will be presented at the Western Protective Relay Conference in October 2008. There are plans to submit the report for presentations at the Georgia Tech and Texas A&M Relay Conferences in 2009.

DTF2: C37.104 Guide for Automatic Reclosing of Line Circuit Breakers for AC Distribution and Transmission Lines - Review of Reaffirmation Ballot Comments

Chair: Gary Kobet

Vice Chair:

Output: Recommendation to the Subcommittee on whether to open guide for revision

Established:

Expected completion date:

The Task Force met on May 13, 2008 with 11 in attendance.

According to RevCom, the guide was reaffirmed on April 28, 2008, with thirty-two comments submitted. The Chairman provided copies of comments received on this reaffirmation ballot.

Each comment was reviewed and discussed, with the following notes:

- Joe Perez will find out if there is a corresponding IEC document.
- Mike McDonald mentioned the NERC SPCTF is developing a document on high-speed reclosing.
- Russ Patterson mentioned a paper that mentions out-of-phase reclosing standards for circuit breakers, will send to the Chair.
- Michael Mendik brought up the possibility of using new technologies such as optical CTs, which have no saturation issues, which might allow faster reclosing.
- Charlie Sufana mentioned that some users of IEC 61850 are installing sensors for detecting gas/oil/water in circuit breakers, information which could be used to indicate a breaker may be in trouble, and might be used to modify reclosing

Following are significant issues that the Task Force believed the guide doesn't specifically or adequately address:

- Coordination problems introduced by using high-speed reclosing at plants where fast-valving is used;
- Guidance/criteria for setting sync-check relay angles;
- A more thorough treatment of weak source/strong source choice for leader terminal in a leader/follower arrangement.

Following the discussion, ten of the attendees voted to open the guide at this time for revision, in order to revise existing material and incorporate new material as appropriate.

The Task Force thus recommends to the Subcommittee that a working group be formed to begin this task.

Next Meeting: single session, 25 attendees, 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

The working group met on Tuesday morning, May 13th, in a single session with 8 members and 7 guests. Total in attendance was 15.

The chair opened the meeting by reading the scope of the working groups assignment and then introductions. After introductions the chair informed the working group that Walter McCannon was working on incorporating comments/suggestions provided by Charlie Henville into the latest draft of the document. After Walter completes the latest draft it will be circulated among the membership.

It was mentioned that Moh Sachdev was chairing the working group on C37.113 and that his group could benefit from the D4 document. A link to the latest D4 draft was sent to Moh.

The working group discussed some of the recent comments on the draft and agreed that many of the "musts" used in the document should be changed to "shoulds". Tom Wiedman suggested that the document may benefit from a review by the I2 terms working group.

Next Meeting: single session, 20 attendees, no projector.

D5: Guide for Protective Relay Applications to Distribution Lines

Chair: Phil Waudby

Vice Chair: Randy Crellin

Output: IEEE Guide PC37.230

Established: January 2002

Expected Completion Date: Completed

The working group did not meet during the May meetings in Kansas City, Missouri. The guide was officially published on February 8, 2008.

The summary paper has been completed and is available for use.

Rafael Garcia, Roger Hedding, and Alex Apostolov gave a tutorial on the guide at the recent Texas A&M relaying conference.

The working group chairman requested that the working group be disbanded. We are not planning on any future meetings.

D9: Revision of C37.113 - 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 May 13, 2008 in Kansas City; Seventeen members and fourteen guests were present.

The Chair reported that Draft 2 of the guide was distributed almost a year ago and only one member submitted comments on the technical aspects of the guide. Five contributions are outstanding. The members were requested and agreed to provide their contributions before July 15, 2008. These contributions will be included in the guide and Draft 3 will be distributed before August 15 for discussion at the September Meeting.

It is planned to ballot the guide in the WG before the end of this year and, if successful, submit the guide in early 2009 to the SA for balloting.

Next meeting: single session, 45 attendees, 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 12 guests present. The WG membership is now 19 with the addition of one new member: S.S. "Mani" Venkata.

Minutes from the San Antonio meeting were read and approved after the correction of making the title consistent throughout the documents. A presentation was made by Mani Venkata on a DOE Advanced Protection Project about DA and Relaying.

The WG reviewed clause 4.1 and Don Parker agreed to make some additions to the clause. Clause 5 was discussed with a few suggested new topics to be added. The discussion then turned to the purpose of the paper. The WG will attempt to define the purpose during the next meeting.

The comments from the DAWG (T&D Committee) will be circulated for comment due to a lack of time for discussion during this meeting. Mani Venkata accepted the writing assignment for Clause 6.10 on Distributed Resources.

The WG is now working on Draft 2.0 of the report.

Next meeting: single session, 30 attendees, computer projector. Avoid conflict with WG K9.

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 May 14, 2008, in Kansas City, MO, in a single session chaired by Alex Apostolov with 5 members and 11 guests present. Two of the guests joined the working group as members.

The working group chair initiated a discussion on creating a list of standard impedance characteristics and addressing their graphical representation, description, and associated settings with the purpose to define

each characteristic in a consistent manner throughout the industry and provide this input to the IEC standard 60255-121.

A present draft 2.0 of the C37-113 standard "Guide For Protective Relay Applications to Transmission Lines" will be distributed to the working group members with the purpose to review the impedance characteristics provided in the guide.

The assignments were distributed to the working group members to collect the standards' C37.100 "IEEE Standard Definitions for Power Switchgear" and C37.113 (contributor is Alla Deronja) and manufacturers'/vendors' (contributors are James Ariza, Jun Verzosa, and Pouria Naisani) impedance characteristic definitions and descriptions. The assignments should be emailed to the working group chair by July 15th, 2008, for compiling and discussing at the next meeting.

An updated draft of the Standard will be circulated to the group by Murty Yalla as soon as it becomes available.

Next meeting: single session, 20-25 attendees, computer projector.

D22: Performance Testing of Transmission Line Relays for Frequency Response

Chair: Tom Weidman

Vice Chair: Solveig Ward

The D22 meeting met Wednesday, May 14, 2008 at 8:00 am with 6 members and 13 guests present. Steve Turner from Beckwith Electric joined the working group bringing the WG membership to 19. This was the WG's third meeting.

Draft 1 of the WG report was discussed. Gabriel Benmouyal presented his contribution to the report on memory polarization sensitivity to off frequency and rate of change of frequency for distance/mho type relays. Included in the Gabriel's report contribution is a concern that heavily loaded lines may have more of a propensity to trip for off frequencies via distance relays with memory polarization. Solveig Ward discussed the susceptibility of memory polarization to off frequencies as a function of time.

Next meeting: single session, 25 attendees, computer projector.

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

The working group met with 6 members and 11 guests present, chaired by Don Lukach. Two of the guests became members.

The January meeting minutes were approved with no changes.

The working group discussed the primary assignment of providing input to WG D9, PC37.113 Guide for Protective Relay Applications to Transmission Lines, commonly referred to as the line protection guide. The chairman provided a generic summary of statements based on past working group discussions and informed the group that the D9 working group wanted the input by mid-July, 2008. Section 6.1.2 of the line guide appears to be the best location for the information, but the specific location and content is within the D9 working group scope.

The chairman offered to develop an initial draft for the line protection guide based on the generic statements. However, the group decided that additional information is needed and specifically, comments were provided about an industry paper that discusses limits to sensitivity. An initial draft for the line protection guide that includes the generic summary and the additional information from the group will be

developed by June 15, 2008. The rough draft will be sent to working group members with the intent of obtaining a final draft that can be given to the D9 working group by July 15, 2008. The context of the output will be in the format commensurate with the line guide and is expected to be limited to a couple of paragraphs.

The working group then discussed possible topics for the PSRC report in a “brainstorming” session. Many topics were discussed and included mutual coupling, single pole tripping, time delay, contingency affects, adaptive capability of directional elements, etc. Two related industry papers were mentioned and are expected to be available to the working group in the near future. The topics will be compiled into an initial outline for discussion at the September meeting.

Next meeting: single session, 25 attendees, computer projector.

Liaison Reports

None.

Coordination Reports

None

Old Business

None.

New Business

None.

High Impedance Fault Activity

None reported

The meeting was adjourned at 3:45 p.m.

H: RELAYING COMMUNICATIONS SUBCOMMITTEE

Chair: A. Apostolov

Vice Chair: V. Skendzic

The Subcommittee met on 05/14/08 with 20 members and 29 guests. Minutes from the January meeting were approved.

Reports from the WG Chairs

H1: Guide for Application of Digital Teleprotection

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 8 guests in attendance, chaired by Marc Benou. Malcolm Swanson acted as vice chair.

January minutes were distributed and approved by those members who were present. A quorum was not present so a request to approve the September minutes will be sent to the members of the working group who were not able to attend. The old IEEE patent policy was distributed. The March 2008 patent policy will be used starting at the September meeting.

At the January meeting Ilia Voloh volunteered to become Vice Chair of the working group since the existing Vice Chair, Mark Allen has been unable to attend. Mark Allen agreed that his future attendance could not be counted on so as of Monday May 12, 2008 with the approval of the H subcommittee chair Alex Apostolov, Ilia is the new Vice Chair.

Draft 1.3, with the latest writing submittals was handed out. Draft 1.3 contains several new writing submittals. Section 4, Communications Infrastructure, has a new paragraph that includes more information on bit errors. It was suggested by the group that the last sentence was too specific in regards to bit error rejection and should be modified. Marc Benou will make the change. Mal Swanson recommended that Section 4 needs an introductory paragraph and volunteered to write it.

Section 4.3 regards connections. Bob Ince submitted a section on Digital Electrical Interfaces. The group agreed it was complete but that Section 4.3 should now include descriptions of Audio and Fiber Optic Interfaces. Bob Ince volunteered to write Section 4.3.2, Audio to Digital Interfaces. Bob has also written the Fiber Optic Section of Section 6. Marc Benou will move the sections relevant to fiber interfaces to Section 4.3.4, Fiber Optic Interfaces. It was brought up that the term ST (in regards to the fiber optic connector) is trademarked. Bob Ince volunteered to check which other fiber optic connectors may be trademarked. Jennie Steinhagen from IEEE was in attendance and recommended we check the Style guide for instructions on how to deal with trademarks.

After a discussion on whether Ethernet should be included in Section 4.3, the group determined to include it in 4.3.1, Digital Electrical Interfaces, as an RJ-45 connection.

Mark Simon agreed to include a list of relevant environmental standards to Section 4.7, Environmental Standards.

After a lengthy discussion on semantics, it was decided that Section 6's title would be changed from "Digital Communication Methods" to "Digital Communication Transport Technology" until a better name is found. The problem is the confusion over discussing different methods or technologies that use the same physical connections, i.e. fiberoptic and SONET.

Section 6.3.2, Licensed Radio was deemed by the group to be unnecessary and will be removed. In regards to radio, licensing or non-licensed radio will be discussed in the spread spectrum and microwave radio sections. Tim Phillippe volunteered to research whether any other radio technology should be included.

Jim Ebrecht volunteered to write the previously unassigned Section 8.1, Communication Schemes/Communications Architecture (name to be determined).

There are 7 subsections left to be assigned. Members that have not turned in writing assignments were reminded to do so.

Jennie Steinhagen and Lisa Perry from IEEE-SA gave some advice on how to get the draft into IEEE-SA standard format. The chair will endeavor to get Draft 1.4 into the IEEE-SA template. Draft guide 1.3 and the May minutes will be distributed to the working group. Writing assignments are due to the chair by August 20, 2008.

H2: Broadband Communications Over Power Line Carrier

Chair: M. Simon

Vice Chair: TBD

Output: Report to the Subcommittee

The BPL Working Group did not meet.

H3: Time Tagging in Protection and Disturbance Recording IEDs

Chair: B. Dickerson

Vice Chair: J. Ingelson

Output: Recommended Practice

Established: Sept. 2006

The working group met on May 13, 2008 in a single session. Eight (8) signed in as Members and Fourteen (14) as guests. Meeting was chaired by Bill Dickerson.

The IEEE Patent Policy slides were shown, and an opportunity was given for attendees to disclose any patent issues. No such issues were identified.

No comments have been received on the minutes of the previous meeting, so they are considered to be approved as transmitted on May 8.

The Chair has assembled all submissions using a consistent format, including the submission from Krish Narendra, which was not yet in the draft sent to the WG on May 8. Alex Apostolov had requested the chair to supply an introduction describing purpose, which was included. This draft was identified as 0.1.

The concepts of reference time, time tag, and trigger time were discussed.

The Chair asked for a paragraph from Members saying what they believe are the important matters for discussion by the WG. Jim Ingleson suggested that members transmit some actual data for discussion. It appears that it will be helpful to come to agreement on basic time definitions.

H4: Revision of C37.111 COMTRADE Standard

Chair: R. Das

Vice Chair: A. Makki

Established 2006

Output: Standard

The Working Group H4, Revision of C37.111 – IEEE COMTRADE Standard, met on May 13, 2008. 12 members and 7 guests were present. Minutes of the January meeting were approved.

Chair discussed the Time Code in COMTRADE vs. C37.232-2007, Recommended Practice for Naming Time Sequence Data Files. C37.232 provides several examples of Time Codes. COMTRADE needs to include minutes of offset as well as hours from time Zulu. It was recommended that the Time Code offset include hours and minutes, following the example in C37-232. For example, -4hr00 would be a minus 4 hours and 00 minutes offset, and 10hr30 would be a positive 10 hours and 30 minutes offset. Pierre Martin suggested that minutes be allowed to be compatible with IEC 61850. It was agreed that chair will issue a ballot to get member's opinion on the issue.

Discussions were held on Draft 4, circulated via e-mail

The Chair first went over the ballot and how to vote using the template.

Pierre Martin brought up the trigger time data point. Should the trigger time be a critical requirement? Discussion followed regarding the trigger time and it was resolved that trigger time not be critical.

Benton Vandiver brought up a number of issues with the present draft. He will send the list to the Chair. A number of word changes were discussed and changes made from his list.

Toward the end of the meeting Stan Thompson brought up a question regarding minutes as suggested by Pierre. Would a – 4 hours and 00 minute offset be -0hr240, or -240? The meeting time had expired, and the question was not resolved. This issue will be resolved by ballot.

Chair will circulate the ballot. After receiving the comments, next revision of the draft will be circulated among members.

H5-a: Common Data Format for IED Configuration Data

Chair: J. Holbach

Vice Chair: D. P. Bui

Output: Report

The group met in Kansas City on January the 14th with 14 members no guests.

The latest version of our common format for settings, describing a distance protection function will be revised and presented as a collection of basic functional knots.

Juergen Holbach and Alex Apostolov will develop a first draft document. This draft document will be the base for a task force working group, which will meet around end of July. The output of this task force working group meeting should be a document that can be distribute to all relay manufacturer for review and revision.

Alex Apostolov gave a feedback on some issues discussed inside the IEC TC37 WG about describing a distance protection function with common setting.

The common settings proposed for a 50/51 over current function where reviewed.

H5-b: Common Data Format for IED Event Data

Chair: M. Adamiak

Vice Chair: P. Martin

Output: Report

The WG met on May 14, 2008 with many attendees. The revisions to the report – now at Ver. 4.01 - were discussed. There were several recommendations to enhance the revisions, specifically,

It was noted that there is a difference in the Time Quality between 61850 (a single bit) and what is proposed in the report (4 bits). It was decided to add an explanation in the text that when mapping the “loss of sync” quality bit from 61850 into the report format, the bit will be mapped as “1111” indicating that the time drift is “unknown”.

There was a discussion about in what format to represent the “Time Offset” value. It was noted that 61850 represents the Time Offset in Minutes and that the present version uses an Hour and Minute format. After further discussion, it was decided to leave the report format as is as it is more human readable and that there was a simple translation between the two formats.

It was noted that the 4-digit Utility Identification code – presently a mandatory value – does not exist for utilities outside of North America. Given this fact, it was decided to make this field “Optional” until such time as the code values are extended to other areas around the world.

It was noted that the “Location” attribute was not included. Initial discussion focused only on the substation where a location is clearly not needed, however, as discussions continued, the value of the location attribute was noted for equipment such as Distributed Generators, remote switches, and reclosers. The Location attribute will be added as an optional attribute to the device description in the next revision

There was discussion about shortening the name of the format. It was decided to change the name from COMEVENDE to: COMMon Format for Event Data Exchange - COMFEDE

After discussions, the WG was polled and there was unanimous approval of the report. The report will now be submitted to the H Subcommittee and the main committee for approval. Pending approval of the stated committees, a PAR will be initiated to make the report an IEEE standard.

H5-c: Common Data Format for IED Sampled Data

Chair: B. Vandiver

Vice Chair: B. McFetridge

Output: Report

The H5-c working group has completed its work.

H6 Substation Ethernet

Chair: J. Burger

Vice Chair: C. Sufana

Output: Report

The meeting was called to order by John Burger. There were 8 members and 29 guests present. Minutes from the San Antonio meeting were approved as presented.

John Burger invited those present to become authors for the summary paper. He would like to see more application examples.

Christoph Brunner gave a short update on what has been happening with IEC61850 improvements. Several updates are expected to be out in 2008. He indicated that Working Group 10 has been busy and will have a meeting next week. IEC61850-90-1 the application guide for IEC61850 is being developed.

John Burger indicated that at the upcoming CIGRE meeting; that there will be a UCA booth and the annual general meeting. The meeting is scheduled for the end of August in Paris. The process bus will be discussed as preferential topic.

Stan Klein indicated that he talked at the IEEE T&D Expo on security.

John Burger reported that AEP has about 300 substations using IEC61850 or its predecessor UCA. He indicated that DFR info is being supplied by relays over the station LAN.

Miriam Sanders gave a presentation on an application using GOOSE in a power line carrier box called UPLC that Ametek is developing. So far a SEL 421 and a GE D60 relay have been tested with it. It is browser based and has Ethernet ports that are electrical or fiber. The UPLC uses IRIG-B, has real time analog values available, has 5 programmable inputs, 10 outputs, and 4 optional trip duty outputs. The UPLC can have on/off or FSK keying. Miriam indicated the UPLC uses a limited standard GOOSE message. The alarms are non-critical GOOSE. There are 34 items in the GOOSE message. Settings and

status are transmitted. Analog GOOSE has such features as transmit power out, margin, and reflected power. The outgoing critical GOOSE messages include trips and guards. Incoming GOOSE messages include carrier stop/start, loopback, line relay key, DTT key, and trip. UPLC has private services and logical nodes. She indicated that the current IEC61850 does not define decibels; which is common for communication equipment. She indicated that lessons learned are that the relay, PLC, and switch must all have the same settings. Also the mapping must be correct.

For the next meeting, the working group will meet in single session and will need a room for 40 people and a computer projector.

H7 IEEE 1588 Profile for Protection Applications

Chair: Galina Antonova

Vice-Chair: Bill Dickerson

Output: Profile (TBD)

Established: September 2007

The group met as a Task Force HTF1 on May 13, 2008 in Kansas City, MO in a singled section with 30 attendees, chaired by Galina Antonova.

After introductions, a status update on IEEE 1588-related activities was given. It was noted that IEEE 1588 – 2008 standard (version 2) was approved on March 27, 2008; an IEC version of it is expected by the end of 2008. IEC TC57 WG10 decided to add an IEEE 1588 profile and will decide on their next steps next week.

The Chair briefly explained IEEE 1588 and Profiles and presented the Task Force assignment. Discussion of an interface to TC57 WG10 and an output of WG followed.

Proposed PAR Scope and Purpose and definition of IEEE 1588 profile were presented.

After an extensive discussion of Scope and larger system issues the group agreed to become a Working Group in a vote with 17 in favor and 1 abstained.

Steve Kunsman made a motion that a Working Group output will be an IEEE Standard, Christoph Brunner seconded. The group supported the motion in a vote with 12 in favor, 3 abstained.

No vote on proposed PAR followed; there were also no strong objections to it.

Requirements for the next meeting: a single session, meeting room for 35 people with a computer projector.

At the H Subcommittee meeting, HTF1 was promoted to working group WG H13

H8 File Naming Conventions

Chair: A. Makki

Vice Chair: R. Cornelison

Output: Standard C37.232

The work of the H8 working group has been successfully completed. The summary paper for C37.232 was presented on Tuesday May the 20th at the Fault and Disturbance Analysis conference in Atlanta and was very well received. With this final step now completed, I respectfully request to disband the working group during our next meeting in September. Thank you for all your guidance, support and encouragement.

The group does not need to meet again during the next meeting. However, the working group will be kept active so it can complete the summary paper and brief the subcommittee. WG will request permission to disband during the next meeting.

H9 Understanding Communications Technology for Protection

Chair: M. Sachdev

Vice Chair: M. Benou

Output: Paper

Established: 2006

Expected Completion Date: 2009

The H9 working met on May 14, 2008; four members and nine guests were present. The outline of the report being prepared by the WG was reviewed and it was decided that it needed some adjustment. Marc Benou agreed to prepare a revised outline. Six sections, previously not taken for writing, were assigned to WG members.

The members were requested to provide their input well before the next meeting so that a draft of the WG report is distributed before the September meeting.

H10 Naming Installed Intelligent Electronic Devices (IEDs)

Chair: R. Cornelison

Vice Chair: J. Hackett

Output: Report

Introductions, 6 members, 6 guests.

Tony Giuliani presented a proposed naming convention based on an existing expert system. After a lengthy discussion, all members were tasked with reviewing the proposal for completeness.

A room for 20 people and a computer projector is 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 May 14, 2008 with 16 members and 17 guests. The IEEE-SA Standards Board Bylaws on Patents in Standards were brought to the attention of the WG.

The minutes of the January 2008 meeting were approved as distributed.

The IEEE Transactions paper is currently scheduled to be published in the October 2008 of Transactions on Power Delivery. The work will be presented at the IEEE PES Summer Meeting. A call for volunteers was made to present the work at regional relay conferences and other forums. The presentation given at PSRC is available for this purpose.

The C37.118 interpretations approved at the Jan meeting have been posted to the working group web page. No new requests have been received.

The IEEE (Jodi Haas) sent a memo to the IEC central office requesting consideration for C37.118 for dual logo status. It was considered by WG19 and has been referred to the national committees for vote. TC95 is listed as a committee of interest.

The PAR for the standard revision was approved with an expiration of Dec 2008. It is hoped the revision will be done before then. An official WG roster will be prepared and submitted based on this inaugural meeting. The revision includes frequency and rate of change of frequency definition, phasor measurements under dynamic conditions, harmonization with IEC 61850, and several other details like file formats for data storage and PDC requirements. The new material will be introduced as annexes to the standard.

Presentations were made on aspects of dynamic phasor measurement requirements by Gabriel Benmouyal, Bill Dickerson, Bogdan Kasztenny, Ken Martin, Arun Phadke, and Jerry Stenbakken. There was limited time for discussion, but these served as an introduction for the issues that will need to be considered. Task teams were selected to draw up proposals for dynamic phasor measurement, frequency measurement, and basic PDC requirements. Actual task team lists and dates will be set out within 2 weeks.

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 May 14, with 27 attendees.

The Chair and attendees reviewed a first partial draft of the Technical Report, with submissions by several

WG members. Certain submissions require updates and modifications that the authors will provide for the next meeting. After a long discussion on network performance and timing, a subgroup of expert WG members agreed to connect and determine what the report should say on this topic. Other WG members owe sections and will provide them for the next meeting.

The WG will meet in Vancouver to review the next draft and new submissions. The meeting scheduling should avoid conflict with H6, H11, HTF3, or I4.

H13 Understanding Requirements and Applications of the Substation Cyber Security Standards

Chair: S Kunsman

Vice-Chair: E. Udren

Output: Report

Established: January 2008

The group met as Task Force HTF3 and held its second meeting on May 13, 2008 with 16 members and 29 guests.

The Chair raised for discussion the question of whether the TF should be reformed as a WG. The attendees see a need for a document and the vote for WG formation was virtually unanimous.

Following objectives were discussed:

- To address utility issues in the definition of cyber security requirements adherence
- To reference typical Substation Automation Architectures including all communicating devices interfacing to and within the substation protection and control system and their relevance to cyber security requirements
- To provide guidance on best technical practices which can aid in the fulfillment of NERC CIP and other Cyber Security standards
- Create a Guide that can be referenced in Substation Automation Systems Specifications

The TF discussed whether a WG can write an IEEE Guide, given that NERC makes and audits the CIP standards now declared mandatory by FERC. Individuals were concerned about completeness or accuracy of advice we might give. Some participants expressed willingness to share company compliance plans. The group discussed using examples to show what the vulnerabilities are, so users of document can make solutions.

There was a formal proposal to define the WG output as a report, and see if it could be turned into a guide later after it is written. This overcomes the concern that we don't yet know enough to write a guide. Attendees accepted this proposal virtually unanimously.

This was followed by discussion of coordination with other IEEE committee activities – to be resolved later.

Scott Mix gave an update on NERC activities, notably those that respond to the FERC order, which makes existing CIP rules mandatory and enforceable. He described the standards drafting process and the opportunities for participation by all.

At the H Subcommittee meeting, taskforce was promoted to working group WG H13

H14 Telecommunications Terms Used By Protection Engineers

Chair: R. Ray

Vice Chair: R. Young

Output: Report

The H14 working group H14 has completed its work. Telecommunication terms glossary was submitted for WEB based publication.

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

1. **Chair: Ken Martin**

2. **Vice-Chair: Jim Ingleson**

Output: Special Report

Established: May 2008

Assignment: Investigate issues related to the use of COMTRADE for exchange of Synchrophasor Data. Develop a profile (scheme) to use COMTRADE for this purpose. Report on other formats that have been used such as “.dst.” Address issues that would arise in converting .dst and other formats to COMTRADE.

Members: Ken Martin, Jim Ingleson, Eric Allen, Jay Murphy, Mark Adamiak. Others will come forward at the first meeting which will be scheduled as a part of the September 9-11 PSRC meeting. in Vancouver BC.

Product: Initially a PSRC Special Report.” Possible creation of an Annex to C37.118 (Synchrophasor Standard). Probably does not make sense to create a separate document for this purpose.

Time Frame: One year (fast track).

Points for Discussion

There is a Standard for event data and it is COMTRADE. NERC PRC-002 requires that Regions shall establish reporting requirements and shall include “provision for reporting Disturbance data in a format which is capable of being viewed, read, and analyzed with a generic COMTRADE analysis tool.” Impact? Are PMUs counted as (NERC) DME, as are some PMUs in NPCC?

“dst” format (describe) has significant advantages for PMU event data. V-I associations are automatic. Easily accommodates phasor data.

COMTRADE can be made to do these things, but it requires appropriate CONFIG labels, and the user of the file must understand the labels that were used. This requires manual intervention. COMTRADE analysis tools will not do this automatically.

Conversion software could be written to convert .dst to COMTRADE. This appears to be straightforward. We are not aware that this exists. There is no apparent reason to have reverse converter.

Appropriate labeling in the .dst file could result in the appropriate labels in the resulting COMTRADE file. There should be to be a standard way of doing this. This is part of a larger issue on standardized labeling.

Various .csv formats made up for the occasion (ad hoc formats) are not acceptable because they lead to delay and inconvenience in the event analysis.

When .dst was created, COMTRADE at that time was ASCII only. DST is designed for PMU data and has features built-in to accommodate PMU data.

What we are proposing is a standardized mapping of data into COMTRADE. Data path may in some cases be into .dst and then into COMTRADE.

As soon as possible our report should serve as a guide for someone to write a conversion program. Another terminology for this is data “profile.”

This WG Report could be designed as an annex to C38.118, the Synchrophasor Standard. It would come into existence as a proposed annex to 37.118 as work in progress. It would not actually be possible to publish it until the 37.118 revision publishes in 2011.

Jay believes that NYISO has a program for converting Macrodyne “long table” to COMTRADE. This would be a good starting point for a .dst to COMTRADE convertor.

Mark Adamiak says that GE has implemented a COMTRADE output for synchrophasor data and he is willing to discuss how they have done this.

It would be important to see that this HTF1 meeting does not conflict with Comtrade, H3, any of the H5 groups, scnchrophasor standard, or related groups.

Liaison Reports

Power System Communications Committee

S. Klein

No report submitted.

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. Besides resolving TISSUES, a series of new features will be added. Some of these new features are:

- New logical nodes for sensors for non electrical quantities (e.g. TTMP – temperature sensor) and for supervision of these quantities (e.g. STMP – Temperature supervision)
- The introduction of a model to do statistical and historical evaluation
- The modelling of functional hierarchies

Part -7-1 and 7-4 have recently been circulated as CDV, part 5, 7-2, 7-3, 8-1 and 9-2 shall follow soon.

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

(3) A task force of WG 10 is addressing the use of IEC 61850 for communication between substations. One typical application is the communication used between two distance protection relays to implement the different teleprotection schemes. A draft report for comment has been circulated as IEC 61850-90-1. During the WG meeting in May, the comments received on that draft report will be discussed and the final report will be prepared.

(4) Another task force of working group 10 is addressing the mapping of IEC 61850 on IEC 60870-5-101 / -104 as it is used in a gateway between a substation using IEC 61850 and the communication towards a control centre using 60870-5-101 /-104. A draft technical specification has been circulated as IEC 61850-80-1. Comments received will be worked in.

(5) In preparation for Edition 3 of IEC 61850, some new topics will be discussed. These topics include security and role based access, redundancy, condition monitoring, time synchronization using IEEE 1588 and system testing.

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

IEC TC57 / WG18 is preparing EC 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 C57. 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). Activities include:

(1) Preparation of a report IEC 61850-90-2: use of IEC 61850 for the communication between substations and control centres. A first draft is expected by the end of this year.

(2) The reference architecture of TC57. A first version has been issued some years ago – currently we are working on a second version.

(3) A standard on harmonized quality codes. Currently, the CDV is under preparation.

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.

Coordination Reports

Old Business

New Business

C37.94 reaffirmation was completed.

Working group H14 “Telecommunications Terms for Relay Engineers” chaired by Roger Ray has completed its work. The new telecommunications terms glossary has been reviewed and approved by the H Subcommittee. It is being submitted to the officers for PSRC WEB page publication.

Taskforce HTF1 was promoted into a working group H7. WG chair is Bill Dickerson, with Galina Antonova as a Vice-chair.

Taskforce HTF3 was promoted into a working group H13.

New taskforce was created to investigate issues related to the use of COMTRADE for exchange of Synchronphasor Data. It was named HTF1 (see above).

I: RELAYING PRACTICES SUBCOMMITTEE

Chair: T. Sidhu

Vice Chair: R. Beresh

The Subcommittee met on May 14, 2008 with 28 members and 43 guests.

- Approval of previous I minutes from San Antonio 2008 – approved
- It was mentioned that a WG can only meet for two sessions before a PAR is applied for. If it takes longer than two sessions the WG must be disbanded and re-formed.

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

Meeting: May 13, 2008

The Working Group met at 9:30 AM on May 13, 2008 in Kansas City; five members and two guests were present. The Chair reported that the balloting of the report has been successfully completed in the WG. Thirteen approved and approved with comments ballots have been received. The comments are editorial in nature.

The Chair will make the needed editorial changes in the report and will submit the report to the Subcommittee Chair in a couple of weeks' time.

Next meeting: The WG does not plan to meet during the September 2008 PSRC meeting.

I2: Terminology Review

Chair: Mal Swanson

Vice Chair: Barb Anderson

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

Meeting: May 13, 2008

The I2 working group met at 11:00 am on Tuesday, May 13, 2008 with ten members. Mal Swanson chaired the meeting.

Minutes from the last meeting were approved.

The terms in Group #6 (DND6058) was revised and approved by the working group,

C37.234: The working group approved one new term from this document, which will be added to Group #6. Oscar will discuss another term, "end-fault Protection", with the Chairman to see if this term should be "blind spot protection". A diagram may help clarify the term.

PC37.105: The working group revised one term that will be added to Group #6.

C4 Working Group paper: Roger Whittaker revised definitions from this document. Work on these terms will continue at the September meeting.

Barb Anderson will have the newest revision of Group #6 added to the website.

Barb also presented a comparison of terms that had been submitted as approved by PSRC (Groups 1 through 3) and those that have been published either in C37.100 Switchgear Dictionary or IEEE 100-7th Edition. The group decided to delete several that have been adequately addressed in IEEE 100 and to submit the remaining terms to the Chairman of C37.100. The files on the website will be changed accordingly.

The meeting was adjourned at 12:20 pm.

I3: Relay Functional Type Testing

Chair: Jerry Jodice

Vice Chair: Bryan Gwyn

Output: Report

Meeting: #2 – May 13, 2008

Assignment

Collect a series of functional tests that could show a particular problem related to system events. Individual problems will be submitted by members of the Working Group and a test report developed for that issue. The individual test reports will then be collated into a Working Group report.

Working Group Assignments

The following people presented test cases:

- Jeff Pond: A misoperations of a Directional Comparison Blocking Scheme on a current reversal during a fault. Parallel line set up
- Steve Turner: Model of a two winding transformer and differential protection
- Drew Welton: Simple event on a feeder protection. 52A contact did not transition due to a problem in the breaker. Breaker failure initiated. Insufficient current to drop targets on all phases faulted.
- Simon Chano: Degraded performance of a distance relay due to low or high frequency.
Tony Giuliante: Benefits of measuring input values while testing electromechanical relays.
- Juergen Holbach: Using data from the 2003 Blackout to test Out of Step protection schemes.

Actions

- Drew Welton: Submit Straw Man template of a Functional Test report so that all reports are consistent. June 2008
- All with assignments: Produce draft test report to template by end of August 2008 and submit to Bryan Gwyn

Note

An overall classification will be developed at the next meeting categorizing Functional Test. E.g. Parallel lines, Transformers. Test approaches can then be developed for each category.

Bob Beresh, Simon Chano and Carl Zimmerman will present cases at the next meeting.

Title of report could be changed to Functional Protection Scheme testing

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 twice on May 13 and 14 with 6 members and 1 guest. We discussed the following TC 95 CDV documents requiring a vote from USNC:

- 95/225/CDV - IEC 60255-11 Ed.2: Measuring relays and protection equipment - Part 11: Voltage dips, short interruptions, variations and ripple on auxiliary power supply port - The test suite now includes checks for a full range of auxiliary power supply quality problems, including short interruptions to zero

or partial voltage, and longer interruptions. Ripple of 15% is specified at power frequency or twice power frequency. The test includes gradual ramp up and down of supply, and reversal of supply polarity. Depending on the problem, the relay must ride through the disturbance with no functional impact, or temporarily cease operation and resume when the supply is restored. The WG decided to cast a favorable vote, with a request for declaration by manufacturers of how long "temporary" is (typically, relay reboot time).

- 95/231/CDV - Measuring relays and protection equipment - Part 1: Common requirements – Major differences from C37.90. Vote in September – more review needed **by July 21**. We found that Clause 5.7 on inrush does not specify source impedance, so we will ask them to change this.
- 95/230/FDIS – IEC 60255-26, EMC Requirements - For RF immunity and ESD tests, IEC has less demanding compliance levels than IEEE C37.90.2 and .3. For RF, IEC requires 10 V/m modulated, while IEEE calls for 18 V/m modulated & 35 V/m unmodulated field strength. The IEC test is thus not a challenge for manufacturers testing to IEEE levels, and the US has consistently viewed it as inadequate and has voted negatively. We cast a vote against this final standard with explanation.
- 95/233/RVD on FDIS – IEC 60255-22-4, Fast Transient Test – We reviewed national committee comments on recent final draft, and only a few of over 40 US comments were accepted.

Not reviewed at the meeting were TC 57 WG 10 documents for IEC 61850, Edition 2:

- Part 7-1: Basic communication structure for substation and feeder equipment - Principles and models - Revision project initiated and CDV circulated with vote due in October.
- Part 7-4: Basic communication structure - Compatible logical node classes and data classes – CDV with vote due in August.
- Part 7-2: Basic information and communication structure - Abstract communication service interface (ACSI) – Comments on CD circulated; new CDV circulated with vote due in October.

I5 Schematic Representation of Power System Relaying

Chair: Kevin Donahoe

Vice Chair: Dave Zinn

Output: Report

Meeting: # 3 – May 14, 2008

The Working Group met for a single session with 9 members and 10 guests totaling 19 attendees on Wednesday, May 14, 2008.

The working group agreed that our output would be a report.

Reviewed minutes and the group assignment from the January 2008 meeting presented at the last I Subcommittee meeting.

Several members submitted examples of schematics and two members gave presentations: Thanks goes to Ken Birt & Dean Miller. Discussion ensued that got into merging nontraditional information on documents being used by internal customers of the utility / company.

More members came forward to present documents to the working group developed at their company. This will be done at the September meeting. Attention was drawn to the fact that C37.2 is close to publication & C16 (Relay Scheme Design Using Microprocessor Relays) is currently meeting addressing topics related to the I5 Schematic representation Working Group.

Next meeting Karl Zimmerman, Jim O'Brien and Jim Platt are scheduled to give presentations.

David Zinn is the vice chair for I5.

WG will need a meeting room accommodating 25 along with a projector.

I8: Guide for Applications of Optical Current & Voltage Systems

Chair: Harland Gilleland

Vice Chair: Bruce Pickett

Output: Guide

Meeting: May 13, 2008

The meeting was called to order by the Chair Harley Gilleland. There were 10 members and 3 guests. All members and guest were introduced – minutes from the previous meeting were reviewed. Details of the steps for getting a PAR now that the preparation is complete and the need for developing the Guide were covered. The other discussions included an update of changes in the Team Leaders that need to be filled – Brian Mugalian accepting the Leadership of the “new words” tracking – a report by Don Parker on training – plus details on the strategy for using the PSRC Core group and electric utilities with experience in optical sensor technology for developing the Guide.

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

Meeting: May 11, 1008

Members

Sahib Usman
Jeff Burnworth
Mario Ranieri
Marie Nemier

Guests

Lisa Perry
Hasnain Ashrafi

1. The request for PAR extension has been approved by IEEE – SA. It is extended to December 2009.
2. The WG discussed the status of the resolution of the negative comments.
3. All of the negative comments resolved so far, the revised Tables 2 &3, and the text changes have been incorporated into the latest Draft D10-7.
4. The only remaining negative comments to be resolved are those from Jim Parello. Marie Nemier has been tasked to discuss with Jim and resolve the comments. She will incorporate the resolution into the updated draft and re- name it as Draft D10-8.
5. The WG agreed that the current version can be issued for re-balloting.

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

Chair: Marie Nemier

Vice Chair: Munnu Bajpai

Output: Revision of Standard C37.98

The working group met on Tuesday, May 13. The WG continues to work on the resolution of outstanding issues and will meet in Vancouver.

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

The working group met on May 13 with six members and four guests present.

The balloting is complete, and the document is on the RevCom agenda for its June 08 meeting. There were 203 people who joined the balloting body. After three Recirculation ballots, there was a 98% approval with two unresolved negative ballots. In addition to the normal three PES Technical Committees (PSRC, PSCC & Substations), the IAS Power System Protection Committee and its Rural Electric Power Committee, and the Rail Traction Standards Subcommittee members participated in the balloting.

Assuming that the document is approved by IEEE SA, the final steps will be to publicize the substantial revisions to this standard – first issued as AIEEE #28 in 1928. This revision adds seventeen new functions (Device 16 – Communications Device) and sixteen acronyms. A poster session paper on the revisions was

“presented” at the IEEE T&D Expo in Chicago last month. Mel Olken has agreed to include an article in *Power & Energy* magazine once the standard is published. An abstract has been submitted to Western Protective Relay Conference for its October 2008 meeting. The IAS Power System Protection Committee and the Rural Electric Power Committee have been contacted for possible future presentations. Members of the I14 WG volunteered to submit presentation proposals to the Georgia Tech and the Texas A&M conferences.

Since this follow on activity can take place independent of PSRC meetings, we will not need a meeting room at the September PSRC meeting, but will give a report at the I Subcommittee Meeting.

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

May 12-15, 2008 Meeting

Working Group I15 did not meet at this meeting. The IEEE SA Standards Board approved the standard on December 5, 2007. IEEE Standard C37.110 -2007 was published on April 7, 2008. Beginning at September 2008 meeting, the working group will meet to start on the Summary Paper.

I17: Trends in Protective Relaying Performance

Chair: Mark Carpenter

Vice Chair:

Output: Periodic Reports to Subcommittee

The working group did not meet.

I18 Anomaly Checks for Relay Settings

Chair: Peter McLaren

Vice Chair: Mukesh Nagpal

Output: Report to main committee

Meeting: # 3 – 05/13/08

The WG met for a single session with 7 members and 14 guests

The chairman circulated the draft questionnaires which had been prepared by several of the committee members. The meeting only had time to consider the questionnaire being aimed at utilities. A lively and informative discussion took place with several attendees recounting particular experiences germane to the aims of the WG. Additions and changes were made to the draft which will be updated for the September meeting. Discussion of the questionnaire for manufacturers will take place at the September meeting.

The chairman invited attendees to send him any further suggestions for either of the questionnaires before the next meeting.

The WG will meet in September for a single session and will require a room to seat 20 and a computer projector.

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

Assignment: Produce a special report addressing redundancy considerations for relaying.

The Working Group met for a single session with 15 members and 20 guests in attendance on May 13, 2008.

We had a presentation by Bryan Gwyn for the NERC draft that previously was to become a redundancy standard but now is being done as a reliability standard. Redundancy requirements are addressed by NERC but are performance based.

It was decided that for now we will keep a summary of the NERC draft for reference in our report.

The report has had good progress and is about 75% complete. A few late contributions will be incorporated in Draft 4a that will be sent out to all members with the minutes. Outstanding assignments are due to the Chair by August 15.

We expect to start the review of the report in September.

The change of the title of the report, suggested by the working group members, to "Redundancy Considerations for Protective Relaying Schemes" was approved by the Subcommittee.

The working group will meet in May for a single session, 30 people, with computer projector, to continue work on the report.

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: May 13, 1008

The third meeting of the Working Group (WG) I20 met on May 13, 2008 in Kansas City, MO in a single session with 10 Members, including 3 new members.

The Minutes of Meeting #2 on January 8, 2008 were approved as submitted.

The PAR for the working group was approved on March 27, 2008 by the IEEE-SA Standards Board and work must be completed by December 31, 2012.

Mario Ranieri, Jeff Burnworth and Steve Turner will review any revisions to IEC Standards that were referenced in C37.90.1-2002, Annex E. Jeff will prepare a presentation on how Annex E is structured for the next meeting of the working group. This will include briefing the working group on any IEC Standard changes that may have an effect on the working group's task. Mario will create a table similar to the one found in C37.90 to identify the relationship of the appropriate IEC Standards to C37.90.1. Tom Beckwith will procure copies of the applicable IEC Standards.

Bob Beresh is a member of P1613-2003 Environmental and Testing Requirements for Communications Networking Devices in Electric Utility Substations and will keep that group apprised of I20 activities, so that changes can be coordinated between the two groups.

Tom Beckwith will coordinate with the Chairman of C57.15 IEEE Standard Requirements, Terminology, and Test Code for Step-Voltage Regulators, that references C38.90.1-2002, to keep them informed of I20 activities.

The working group reviewed the IEEE PC37.90.1 Draft 2 edits and discussed the justification of which documents appear in the Bibliography and References clauses. Mario mentioned that the latest 2007 Style Manual should be reviewed to verify this and other issues. Tom will email the new Style Manual to all working group members.

After the January meeting, an Explanation was submitted in response to a "Request for Interpretation of C37.90.1-2002". Tom Beckwith will review the response and determine how Clause 8.2 Common mode tests and Clause 8.3 Transverse mode tests may be edited to improve clarity.

Mark Simon will revise the Note from Example 1 and 6 of Annex D and generally proofread Annex D.

Tom will separate and track changes from Draft 7 to the published 2002 version of C37.90.1.

Barb Beckwith mentioned that some of the terms appearing in "Clause 3. Definitions" of our standard are listed in *The Authoritative Dictionary of IEEE Standards Terms*, 7th Edition, but with some changes. She will make a further comparison for the September meeting.

Barb also will review the document for consistent usage of terms as defined in the Definitions and in Clause 7.

Requirements for next meeting in September: Single session; 20 attendees; Computer Projector

ITF1 Manufacturer's Service Letter Database

Chair: Jerry Jodice

Vice Chair:

Output: Service Letter Database

I TF#1 met today briefly, with Tarlochan Sidhu, TW Cease, Tony Giuliante, and Mario Ranieri present.

There were no additional Manufacturer Advisories provided.

A request to re-establish a password to the Doble portal was received...and has been communicated to the IT Manager at Doble.

The meeting adjourned with no further action.

ITF2

Chair: Lubo Kojovic

Vice Chair: TBD

Output: TBD

Meeting # 2 - 14/May/2008

The Task Force met for a single session with 6 members and guests. It was decided that the TF ask the "I" subcommittee to become a WG and that the TF would meet in Vancouver to work out a scope.

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 Plaza, Marriott Country Club Plaza, Kansas City, MO on May 14, 2008. Seven members and two guests were present.

Two staff members from IEEE were our guests: Jennie Steinhagen and Lisa Perry. They were interested in observing the start up and planning of a Task Force as part of the standards creation and review process.

The Task Force discussed a plan to review the relevant IEC standards related to the grounding of instrument transformer secondary circuits and cases. Jennie volunteered to look up an existing document that compares IEEE and IEC standards as a starting point. The Chair also asked folks to perform a search to find any other relevant documents. Vittal Rebbapragada who did not attend the May meeting volunteered at the January 2008 meeting to provide a summary of IEC documents for review. When the comparison list and search by the Task Force members is complete, the Chair will assign each member a group of IEC standards to study. At the September 2008 meeting, the Task Force will review the relevant IEC documents to discuss and determine where to include them in the guide. Jennie will be able to provide Word document formats of C57.13.3-2005 and any IEC standards of interest to the Task Force to facilitate the creation of a draft of the guide. The Task Force will need one or two more sessions to develop an outline of work, before requesting the change to become a working group.

Bruce Magruder volunteered to be Vice-Chair of the Task Force.

The Task Force will meet in Vancouver B.C. in September to create an outline of what sections of the guide can be revised to include the applicable IEC standards. We will use the Wednesday 8:00 a.m. time slot, room for 25 people, and a computer projector.

At the conclusion of this business, the meeting was adjourned,

Liaison Reports

Instrument Transformer Sub committee

Del Weers, I subcommittee liaison with Instrument Transformer Sub committee

The transformer committee met in April in Charlotte, NC

The report on the Instrument Transformer subcommittee activity follows:

1. The C57.13.1993, Instrument Transformer Standard has been reviewed, approved and balloted with only one comment to resolve. It is at IEEE Hdq. for final review and printing.

A working group is starting another review to consider a number of suggestion not included in the version now balloting.

2. C57.13.5, Test Requirements for HV Instrument Transformers is being reviewed by a Working Group.
3. The working group for the Optical Current and Voltage Sensing Systems Standard, P1601, has been completed
 - The document is now in the balloting stage.
4. A technical presentation was made on a method for verifying relaying CTs circuits are meeting accuracy limits for revenue metering. There was a request that it be considered for addition to C57.13 standard.

This brought a number of responses. Examples follow:

- C57.13 standards purpose is not suitable for this subject.
- There may be other standards that are more applicable. C57.13.1, Field Testing Relaying CTs standard was mentioned..
- There are a number of other products and services that do this job not just this one.

Coordination Reports

None

Old Business

None

New Business

ITF2 requested that it be made a WG. The subcommittee members voted and approved this. ITF2 is now I6.

J: ROTATING MACHINERY PROTECTION SUBCOMMITTEE

Chair: W. G. Hartmann

Vice Chair: K.A. Stephan

The Subcommittee met on 5/14/08 with 16 members and 13 guests. Minutes from the Jan 2008 meeting in San Antonio, TX were approved with quorum.

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: 2008
Status: Draft 7

1. The Working Group met for a Single Session with 12 Members and 4 Guests on May 13, 2008.
2. The Charlotte Minutes of Meeting #14 were approved.
3. The main effort for this meeting was to review and resolve the four comments received from Charlie Henville the Chairman of the PSRC as part of the Officer's approval process. They are the following:
 - a. The document needs a table of contents for people to find their way around this 40 page document. This is a relatively minor editorial comment, but I think it would add a lot of value to the document. – Steve Conrad to address.
 - b. Section II – Definitions should show the source for each definition. The references are given at the end of this section, but the reader doesn't know which definition is from which source and which (if any) are newly defined in this document. This problem is not critical for a report to the Committee like this, but if it is possible to provide the sources for individual definitions it would be helpful. Also, if there are any new definitions they should be sent to the PSRC Terminology WG. – Dale Finney et al. to address.
 - c. Section IX – Conclusion. There is no discussion of Figures 6-15. I suppose this is acceptable for a report to the Committee, but I am surprised there is no explanation of the different figures. Even a notation like "Functions of numbered protection devices can be found in C37.96. Detailed description of each figure is not provided since the protection applications are in accordance with C37.96 and the Transformer protection guide." - Wayne Hartmann et al. to address
 - d. Figures 14 and 15 show no motor protection (except thermal) while the motor is connected to the ASD since the only CTs are on the supply fro the bypass. Is this correct? If so, there should be some sort of explanation or comment as to why there is no need for CTs on the supply from the ASD. – Tom Farr, Adrian Guggisberg, Chris Ruckman, Wayne Hartmann to address.
4. A few other minor editorial comments were addressed.
5. All assignments are due no later than June 30, 2008.
6. After the completion of these final changes, the edited sections will be sent to the PSRC officers for their information. At that time the Working Group Report will be submitted to Russ Patterson for placement on the PSRC website.

At this time, the Working Group requests a meeting room for 25 attendees with a computer projector for a single session in September. This is in case there is a need to further address any outstanding concerns that may arise.

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 2

1. Introductions – 6 members & 2 guests
2. The WG reviewed and approved the January 2008 meeting minutes without revision.
3. The WG reviewed and approved Draft 3 of the paper and made the following assignments:
 - Abstract – Mike Reichard to complete.
 - IV. Key Protection Elements and Considerations
 - A.1 Low Frequency Response

- Figure 4 DFT Response – Dale Finney to revise and make the small sine wave solid and the constant wave dashed for easier reading, and include additional verbiage describing the simulation.
 - Figure 6 - Mike Reichard to incorporate revised results from Dale Finney for his 5.4 Hz simulation work.
 - Paragraph 4, page 3 – Dale Finney to review and revise, as appropriate, based on his 5.4 Hz simulation work
 - B Drive Mechanism Protection
 - Mike Reichard to contact Manufacturer B and get a list of protection elements that are provided as part of the Drive Mechanism. Then replace Manufacturer A and B figures (pages 5 & 6 respectively) with a single generic oneline and list each manufacturers drive protections.
 - Mike Reichard to label and number figures.
 - C Generator Protection:
 - Wayne Hartmann to revise all figures to show 51G connection from bottom of CTs (not center tapped as currently shown).
 - Mike Reichard to label and number figures.
 - Wayne Hartmann to revise Generator Protection (Grounded) Manufacturer C figure (page 9) 76GS connection to show input from generic current sensing device.
 - Wayne Hartmann to revise Generator Protection (Ungrounded) Manufacturer C figure (page 10) to standardize relay shapes to match the other figures in this section.

Assignments due June 27th, 2008

J4: Revision of C37.102 AC Generator Protection Guide

Chair: M. Yalla

Vice Chair: K. Stephan

Established: 2000

Output: Guide

Status: Published

The Working Group met on Tuesday, May 13, with 7 members and 9 guests.

Discussed the merits of a summary paper to advertise C37.102. The majority of those present felt the Working Group J8 Tutorial will be the summary of C37.102. The working group desired to vote on whether or not to make an IEEE Transactions Paper. Since quorum was not present, the vote will be carried out by e-mail.

The chair noted that IEEE Transactions do reach foreign entities, however, the working group felt strongly that we should utilize other venues for publicizing the revised guide such as: IEC, IEEE, CIGRE, PES Network. Lisa Perry, IEEE Standards Editor, was at the meeting and will pursue options from the marketing branch of IEEE Standards.

Discussed NERC activity with respect to generator protection. FERC is asking NERC to provide settings guidance for generator protection. A couple of “J” working groups have interest in this activity, especially JTF3 chaired by Joe Uchiyama. There was discussion on whether or not C37.102 should be revised to meet whatever comes out of the NERC group. The general feeling was that C37.102 should remain broader in scope and settings than NERC criteria, however, the NERC criteria should fit within C37.102. If it does not, then there may be reason to modify C37.102.

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

Chair: J.T. Uchiyama

Vice Chair: R. Das

3. Co-Vice Chair: Mike Reichard

4. Established: 2000

5. Output: Revised Guide

6. Status: Completed

The Working Group did not meet this session. The working group will produce a summary paper.

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 16 members and 7 guests. 1 person joined the working group.

The minutes of the San Antonio, TX meeting in January 2008 were approved.

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 0.20.

J. Gardell proposed clarifying any confusion that may exist about whether to use saturated or unsaturated impedances in setting calculations. It was suggested that a paragraph could be added to chapter 1 in the tutorial discussing the issue and clarifying that saturated values should be used. K. Stephan noted that the same issue was discussed during the revision of C37.102 and the saturated values were recommended. Z. Bukhala will assist J. Gardell in writing a paragraph on reasons why saturated values are recommended.

J. Gers proposed using a format with only one column during the drafting process. M. Thompson noted that the two column format was preferred but suggested that members work in the format with which they are most comfortable. Sections prepared in a single column format can be converted at a later date.

Chair reported that drafts for nine chapters have been submitted or revised since the last meeting. Reports were given by the authors on the individual sections:

- Section 1 – C. Mozina reported that a total of 6 pages of new material has been added, most of which came from existing PSRC papers. Chuck will add a discussion of hybrid grounding to the section. Z. Bukhala agreed to perform a peer review on the chapter.
- Section 2.1: Stator Phase Fault Protection – D. Finney volunteered to help with the section. M. Thompson will contact J. McElray to gauge future interest.
- Section 2.2: Stator Ground Fault Protection – Draft has been received and reviewed. It was noted that hybrid grounding has already been added to the section.
- Section 2.3: Field Fault Protection – J. Gers agreed to do the peer review.
- Section 2.4: System Backup protection – C. Mozina wants to add additional material to the section. M. Thompson will forward material related to the limited value of load encroachment schemes. M. Thompson suggested that load encroachment get limited or no discussion in the tutorial and emphasis be added on the new recommendations in C37.102.
- Section 2.5: Gen. Breaker Failure – C. Ruckman reported that a draft is imminent. When finished, the chapter will be sent to S. Patel for review.
- Section 3.1: Abnormal Frequency Protection – S. Conrad reported that work on the section has begun and should be ready for peer review by the end of June. J. Johnson volunteered to perform a peer review for the section.
- Section 3.2: Overexcitation and Overvoltage Protection – R. Hamilton reported that work on the section has begun. It was noted that the section will expand more on coordination with the AVR. A draft should be ready by the next meeting.
- Section 3.3: Underexcitation/Loss of Excitation – A draft has been received and will be reviewed by M. Thompson by end of June. M. Sachdev agreed to perform a peer review on the section when it is available.

- Section 3.4: Current Unbalance Protection – K. Stephan reported that the draft is complete without significant changes. It was noted that the negative sequence capability of round rotor generators was recently changed in C50.13. J. Gardell will check with Michalec to see if the new numbers in C50.13 are valid for the older designs. There was a discussion on how much the issue of GIC should be addressed in the tutorial. It was agreed that the brief mentioned in the tutorial is appropriate.
- Section 3.5: Loss of Prime Mover – D. Finney reported that the section has been reduced in size by two pages. Sequential tripping was broken out and a table was added that lists typical values of motoring power. P. Kerrigan volunteered to perform a peer review for the section.
- Section 3.6: Out-of-Step Protection – J. Gers reported that the text concerning stability analysis was simplified. A paragraph was added on the analysis of a Comtrade file that can be used for stability analysis. The section was reduced to 10 pages. M. Yalla and C. Mozina will provide a peer review for the section.
- Section 3.7: Voltage Transformer Signal Loss – C. Ruckman reported that a draft is imminent with only minor changes to the original. When finished (due end of June), the chapter will be sent to W. Hartmann for review.
- Section 4.1: Inadvertent Energizing – C. Mozina reported that the section is not ready for review. The front end of the section is still good. The end of the report needs to be updated to reflect the modern schemes based on C37.102.
- Section 4.2: Special Operating Modes – P. Kerrigan reported that the section will be ready by the next meeting.
- Section 5.1: Tripping Modes – S. Kim reported that the section will be ready by next meeting.
- Section 5.2: Multifunction Generator Protection Systems – D. Finney reported that the peer review was complete with few suggested changes. It was noted that an edit to the diagram showing two relays might be necessary. The question was raised as to whether both relays should have identical protection. It was the general consensus that both relays should have the same protective functions except for possibly field ground.

C. Mozina noted that thought should be given to creating drawings in the document that could be easily used for presenting the tutorial at a later date. Chair noted that presentation technology has changed significantly since 1995 and rarely do figures used in a paper work for presentations. It was suggested that the suitability of the figures for the presentation be readdressed during preparation of the tutorial presentation.

Chair requested that writing assignments be submitted for distribution by August 31, 2008 unless otherwise noted.

Chair noted that he will forward all drafts to the appropriate reviewer.

J9: Motor Bus Transfer

Chair: Jon Gardell

Vice Chair: Dale Fredrickson

Established: 2006

Output: Transactions paper or report

Expected Completion: TBD

Status: Draft 0

Seventh Meeting, 5/14/2008; Double session:

1. Introductions, 20 members and 10 guests
2. Working Group approved the January meeting minutes.
3. Discussed plans for staged bus transfer testing at TVA Paradise Plant, tentatively in 2009. Discussion included plant electrical layout, measurement points, data acquisition, etc.
4. Discussed the 14 topics identified previously and assignments submitted and outstanding.
5. Jon Gardell will prepare a first draft of the report for review by the Working Group in the September meeting.

6. Working Group J9 requests a room, with computer projector, for 30 attendees for a double session during the September meeting.

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 12 members and 3 guests. After the introductions, the Patent Slides were shown.

The San Antonio meeting minutes which was circulated was approved with quorum.

Various assignments were reviewed. Peer reviewers were assigned to various tasks as shown in assignment log (shown at end of meeting notes, item numbers refer to point numbers). Following is follow up required. All remaining assignments/peer review are due by August 15th.

- 1) Jon Gardell would modify item 3 written assignment based on comments of WG (put units for all items in equations, correct the torque variable) and send them to Mike Reichard.
- 2) Item 4 would be assigned at later stage.
- 3) Items 5 and 7 and 10 would be peer reviewed by Chris Ruckman
- 4) Item 6 –Tom Farr would submit Considerations for settings derivations for reduced voltage starting (Tom Farr)
- 5) Summary of Item 8 (J1 TF) and 9 (J10 TF) that would need to be included in guide would be assigned later. Sahib Usman volunteered to participate in summary of item 8.
- 6) Jon Gardell would provide input for Item 11 to Sudhir Thakur.
- 7) Item 2, 12 and 14 would be peer reviewed by Dale Finney.
- 8) Item 13 would be peer reviewed by Prem Kumar.
- 9) Item 15 would be peer reviewed by Matt Basler

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

The task force met on Tuesday, May 13, 2008 for a third time in a double session with 30 people.

The chair welcomed everyone to the meeting, then started the meeting with introductions and reviewed the goal of the task force, which was based on the August 14, 2003 blackout around the NEPP region.

The task force then started discussion of specific protective functions including phase distance, overvoltage, undervoltage, loss of field, voltage-controlled / voltage-restraint overcurrent, volts/Hz, out-of-step, under/over frequency, and directional power relays.

The chair prepared a document for this meeting and the discussion of the protective functions was very valuable. A revised document will be presented at the next SPCTF/NERC meeting in Chicago on June 10-12, 2008.

Liaison Reports
Electric Machinery Committee

C.J. Mozina

- The EMC last met at the PES General Meeting in Tampa in June in 2007. The Committee will meet at PES General Meeting in Pittsburgh, July 21-25. Nothing new to report until after this meeting.

IAS I&CP 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

Some modifications were made to the standard but none affecting power system relaying.

NERC

J. Uchiyama

The NERC SPCTF met April 12-14, 2008 at Georgia Power in Atlanta, GA.

SPCTF's present activities are:

1. Consolidation of some of the PRC documents
2. Working on unification of definitions
 - a. BES—Bulk Electric System
Each region has its own definition. FERC defines it as all above 100 kV. Most regions use above 200 kV.
 - b. Misoperation of protective relaying system
3. Redundancy of protective system (separate communications, batteries, relays, trip coils, etc.)
4. Generator backup relay application and verification.

The next SPCTF meeting will be June 10-12, 2008 in Chicago, IL.

Coordination Reports

None

Old Business

C37.106 needs to be circulated for reaffirmation. This will be started by the subcommittee chair and vice-chair.

New Business

Presentation by Prem Kumar and Dale Frederickson on coordination of system studies needed for setting generator protection.

New task force on wind farm protection will be formed under the "C" sub-committee. This group will need our "J" members to attend as rotating machinery is involved in the protection of wind farms.

New Members: Russ Patterson and Sungsoo Kim

K: SUBSTATION PROTECTION SUBCOMMITTEE

Chair: F. P. Plumptre

Vice Chair: P.G. Mysore

The K-Subcommittee met on Wednesday May 14, 2008, in Kansas City, MO with 15 members and 33 guests in attendance. The minutes of the January meeting in San Antonio, TX was approved.

ITEMS OF INTEREST FROM THE ADVISORY COMMITTEE MEETING:

None

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, on Wednesday, May 14, 2008. Two members and five guests were present.

The chair reported that the balloting group for the guide consisted of 248 members; 215 members submitted their ballots. The initial ballot included 13 disapprove-votes. Twelve of the thirteen negative ballots were resolved. The thirteenth negative ballot could not be resolved because the balloter had moved and had not left a forwarding address. However, the concern of that balloter was out of scope for this guide.

The recirculation of the guide was successful. The guide was then submitted for approval by NesCom and then by the SA board. The standards Board approved the guide in the last week of January 2008. The SA Editor is reviewing the guide and is preparing it for publication. One pass of review has been completed and the second pass is substantially done. The final check will be completed next week. The guide is scheduled to be published in June 2008.

The chair reported that no patent issue was brought to his notice in the past and he has reported this to SA. It was agreed that the WG does not intend to seek patent on any of the material contained in the guide.

The WG identified that the material that ought to be included in the summary paper that could be presented at the regional protection conferences. The paper will be prepared and submitted to the Subcommittee in eight weeks time.

The working group will not meet in September 2008 meeting of PSRC.

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

Chair: Charlie Sufana

Chair requested to meet again in September to explore any interest in revising this guide.

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

Working Group K3 met 5/14/08 with 8 members and 9 guests.

The Agenda followed was:

1. Call to order and introductions.
2. Minutes from previous meeting was reviewed.
3. Draft 11 was discussed and Transactions Summary Paper Draft-0 was reviewed and initial comments were taken.
4. Assignments that had been put on hold will now be completed-
 - a. Frank Plumtre and Pat Carroll to revise and simplify figure 5 in full document / figure 2 in Transactions paper along with text.
 - b. Paul Elkin to review section 3c/5b in Summary Paper for duplication and related section in full paper and make appropriate reduction if possible.
 - c. Once completed, full paper and Summary Paper to be submitted to WG for approval vote, and then to subcommittee as working group report to be posted on K website.

Anticipated schedule is:

6-2-08 or sooner- Revised figures and comments back to Bruce and working group

Tarlochan from entire

6-6-08 Revised paper to be sent out for ballot

6-27-08 WG Ballots due back

7-??-08 Ballot Subcommittee via Frank Plumtre

Full paper to be a Report to the PSRC Subcommittee & summary paper to be a submission to Transactions.

KTF4: (PC 37.95.2002): GUIDE FOR PROTECTION CONSUMER UTILITY INTERFACE

Chair: Mukesh Nagpal

Vice Chair: TBA

Established, xxx

Output: Consider revision to guide

Expected Completion Date: xxxxx

The task force met with 18 people attending.

I. There was a lot of interest and discussion on revising this guide. Specific discussion topics included.

- revise section 7.4.4 on Protection of Supply Line. Mention application problems with device 32P application. Discuss alternatives to this protection

- impact to utility line terminal application (use of directional vs non-directional relays) when consumer has generation

- add new section on micro-p relays considering application opportunities

- add or revise section on quality protection. Describe its purpose. How is this protection coordinated with under frequency protection. Describe problems with LV connection of quality protection when tap changer operates.

- possible need for transient studies (beyond scope of doc) but mention anyway – cases where consumer has large motor loads and/or generation. Describe possible protection solutions, implications ie: delayed tripping of utility breaker.

- incorporate Ballot comments from the previous reaffirmed document

II. Per Chuck Mozina there is a desire for assistance from the IAS (IEEE Industrial Applications Society) to help this organization revise the color book series. In particular (for this group) sections in the old “buff” book. Agreed, that if PSRC working group formed, this group would work with Chuck to provide assistance.

III. Unanimous vote to form WG.

<Post meeting note in the ‘K’ Sub committee meeting it was proposed that a working group be formed to revise the Guide for Protection Consumer Interface. This motion passed and the new WG formed is K4>

Action items for future:

- send out minutes to KTF4 attendees

- Put in motion PAR request documents to form an official IEEE project, and liaise with our Standards Liaison Jeff Gilbert

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, May 13, 2008 in Kansas City, MO; with 12 members and 9 guests.

In Simon Chano's absence Dean Miller led the meeting.

The minutes from the January meeting were approved as written.

Draft 4 of the report, which was distributed to the working group members earlier, was discussed. The format of the report was changed to improve the flow of the material. The new format changed the order and grouping of different subject materials. As a result of the discussion the following writing assignments were made:

1. Martin Best will write section 2.1 Protection Concepts. He will be taking the list of concepts now in the section and the earlier writing contribution of Randy Crellin as reference material to formalize this section.
2. Roger Whittaker will write section 2.2 Control Concepts. This section will include clauses: 2.2.1 Operator Initiated and 2.2.2 Automatic Controls.
3. Dominick Fontana will write section 2.3 Monitoring Concepts
4. Roger Whittaker will revise section 5.0 *Application of Other Control Functions to include notes on the different ancillary functions that need to be present in the line, bus, or breaker relays to accomplish the different breaker control configuration options described in this section.*

These writing assignments are due to the vice chairman by July 1.

The following were also discussed and consents arrived at that:

1. The scope in the report will be checked to verify that it matches the original scope and the scope on the working group web site.
2. In this report the word "multifunction" will not be hyphenated.
3. In this report the center breaker in a breaker and a half busing arrangement will be called the "middle breaker".

The goal is to complete the report this year. It was decided that it is premature at this time to discuss writing a summary paper.

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

The working group did not meet during the May meetings in Kansas City, Missouri.

The working group is currently working on the development of an interactive web based survey which should be completed by the end of May.

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

- 2007 WPRC
- 2007 MIPSYCON
- 2008 Texas A&M
- 2008 Georgia Tech – pending
- WECC Members (from Gene Henneberg)
- PSRC Main Committee
- Power System Protection Yahoo Users Group (Russ Patterson) – pending

Our current plans are to send a functional version of the web survey to the PSRC officers for comments and approval the first week in June. Then send the survey request notices to the recipients by mid June,

with the survey period closing mid August, organize the survey responses by the first of September, and meet to discuss during the September meeting in Vancouver.

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 this session. A second draft summary paper was e-mailed to all active working group members just prior to the May 2008 PSRC meeting. It was agreed in a past sub-committee meeting that the summary paper would be in the form of a report to the Substations Sub-committee of the PSRC. The working group members need to reply to the e-mail with approval, approval with comments, or disapproval so that the summary paper may be completed and the working group disbanded.

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

K-8 met on May 14, 2008 in one session with a total of fifteen attendees, nine members and six guests. John Appleyard joined the working group as a member.

January 2008 Meeting minutes were reviewed and approved.

The chair informed the attendees that the working group would be meeting jointly with the Capacitor subcommittee once a year in the future.

Discussions on draft 1 were the major part of this meeting. The attendees went through the draft in an overview fashion.

Unfused capacitor banks were discussed. It was decided to move the discussion of unfused banks to annex if unfused capacitors were not a common item of supply from the manufacturers. This will be checked with the manufacturers. – Action item – Pratap

Paul Elkin would try to combine Secs. 4.2 and 4.3.

Nomenclature - Split-wye and double-wye would be verified. At present only double-wye is used in the standard.

Greg Sessler would review System Considerations-clause 6

Iliia Voloh is reviewing and revising clause 8, unbalance relaying methods. Since this makes up a large portion of the guide, John Appleyard agreed to review clause 8 with Charlie Sufana. Arvind Chaudhary would follow up with Felix Navarro, who had commented on the tables provided in this clause and solicit his input on suggestions to improvise these tables. He will also contact Carey Cook of S&C Electric and solicit his input. All members would review clause 8.0 for clarity, ease of use from the perspective of a user reading the Guide for the first time.

Russ Patterson would provide input on bridge configuration input.

Arvind Chaudary would review the Filter banks.

Michael Mendik would review synchronous closing.

Greg Sessler would consider additional information on Operations

Arvind Chaudhary, Bogdan Kastenny, and Pratap Mysore would write a new section on additional schemes.

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 on May 13, 2008 with 9 members and 14 guests. Draft 5.0 was distributed and for the majority of the meeting we reviewed Section 6, Current Utility Practices, with the intent of reconciling Section 6 with existing Section 4, which describes protection schemes to mitigate arc flash.

Here is a summary of the changes:

- The WG developed a list of bullets that summarizes Current Utility Practices. The existing Section 6 will be replaced by this list. The Chair will add this revised section for the next draft.
- Jay Sperl provided a write-up for the beginning of Section 3, to clarify the applicable standards section.
- Appendix A: Figures to be re-inserted and impact of using instantaneous tripping on example included. (KZ)
- John Tengdin provided a list of Canadian safety standards to be referenced. Also, educated the group on the new "AFD" device number – "Arc Flash Detector" to be included in Section 4 write up.

Deadlines:

Patrick Carroll and Karl Zimmerman to revise document and send to WG members and guests for comments by e-mail by June 8, 2008.

Members and guests have three weeks to review and provide comments. Comments due back to Chair by July 3, 2008.

"Final" draft to all members and Substations Subcommittee to go out August 1, 2008. Substations Committee members are asked to respond by September 1 in time for September meeting in Vancouver.

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 May 14, 2008 with 6-members and 1-guest. I updated the group on recent SCC21 activities which included formation of a balloting group for Reaffirmation of IEEE 1547-2003 which closed March 20, 2008. Also P1547.2, which is the application guide for IEEE1547-2003, completed balloting on May 5, 2008.

We discussed activities associated with P1547.4 "Draft Guide for Design, Operation and Integration of Distributed Resource Island Systems with Electric Power Systems" and P1547.6 Recommended Practice for Interconnecting Distributed Resources With Electric Power System Distribution Secondary Networks". Both working groups met the first week of Feb 2008 in Atlanta.

P1547.4 is now at Draft 4 and is available on the SCC21 web site with a password which I can supply on request. This working group expects to go to ballot in early '09. P1547.6 moved to draft 1.1R and is also available on the SCC21 web site. As Charlie Sufana has pointed on many occasions, network protectors are not designed for generator breaker applications. This working group still has quite a bit of work before it will be ready for ballot.

During open discussion Fred Friend of AEP told us about his companies test installation of a 1 megawatt sodium sulfide battery system used for peak shaving. AEP also plans to install a 2 megawatt site for further testing. Both installations are located in distribution substations for testing and evaluation convenience.

Frank Plumptre from BC Hydro told us about his company's recent call for "Bio Energy". Their region of the country has been devastated by pine beetles so there is an on going effort to install generation that can take advantage of this newly available fuel source.

If you have special interest in the progress of a particular SCC21 working group or would like to provide input, let me know and I 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 Plumptre

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 working group did not meet at this meeting

As per the January 2008 minutes, the working group will produce a transaction paper as a summary paper for the Guide. The goal is to present the transaction paper at the IEEE PSCE March 2009 meeting in Seattle, Washington.

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 held May 14, 2008 in Kansas City, with 15 members and 24 guests in single session. Chairman Bogdan Kasztenny presided. The minutes of the January 2008 meeting were approved as printed.

The Chairman discussed the IEEE patent requirements and reviewed the status of the guide to date. The current draft is D7.01

Draft #6 was updated via several very successful teleconferences these are reflected in the current draft 7.01.

Recently edited clauses were discussed and include the following:

- Differential overcurrent methods 7.1 DoCarmo; Bogdan Kasztenny, Stan Horowitz, John Burger and Hyder DoCarmo will finalize this clause; Mike Thompson will rephrase the sub-clause on setting recommendations
- Blind zones / sequential tripping / end fault protection 8.4 (P.Mysore); Bogdan Kasztenny and Fernando Calero will prepare a proposal reconciling the two versions; Annex D to be an example for various applications
- BF Considerations 8.9 (Whittaker)
- Backup considerations 8.9 (Whittaker)
- Stub bus considerations new clause 8.7 (Miller) – Ken Behrendt will review this new material
- CT Column ground fault protection new clause 8.8 (B.Picket) – Jim O'Brian will review this new material

Bruce Picket made a presentation to the WG which discussed the results of a CT column failure of a 'hair pin' design as related to the "CT column ground fault" clause of the guide.

Annex B material is partially included in the document; therefore the Annex will be withdrawn.

Delbert Weers agreed to work on consolidating comments for section 6 on CTs. Gustavo Brunello previously expressed interest in working on section 6 and will coordinate with Delbert.

The chair will be developing a schedule for future teleconference meetings with a modified format that will include a delivery of re-edited/cleaned material for the group to review and approve.

Liaison Reports:

Nothing to report

Old Business:

Nothing to report

New Business:

Chair presented the possibility of forming a task force to revise Series Capacitor Protection guide with active participation from Capacitor T&D subcommittee. After several discussions, it was decided to wait for an year before proceeding with the revision.

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 three interesting presentations.

- Guide for Application of Protective Relays for Abnormal Frequency Load Shedding and Restoration Alex Apostolov
- Rev. of Guide for Field Testing of Relay Current Transformers C57.13.1 Don Sevcik
- Justifying Pilot Protection on Transmission Lines Gary Kobet

Future Meetings:

September 7-11, 2008

Burnaby, B. C., Canada

January, 2009

Joint PES Meeting, Location Orlando, FL(tentative)

May 10-14, 2009 –

Pittsburgh, PA

VIII. The meeting was adjourned by Chairman Charlie Henville.