## H: RELAYING COMMUNICATIONS SUBCOMMITTEE

**Chair: V. Skendzic**
**Vice Chair: E.A. Udren**

The Subcommittee met on January 13, 2011 with 18 members of 38 total, plus 33 guests. This was just short of a quorum. Minutes and other SC questions are to be approved in post-meeting e-mail voting.

The travel of the Chair was interrupted by weather; the Vice Chair conducted the meeting.

The Adcom recommended no general announcements for the Atlanta meeting.

Old business:

No old business was brought before the Subcommittee in Atlanta.

The May 2010 minutes described the creation of a pipeline of new Task Force projects – a queue that gives visibility to planned or requested activities, when the PSRC schedule is too full to launch them. This helps with prioritization of new work. It also helps with solicitation of Task Force leadership and membership, and development of scope or assignment.

One queued activity was elevated to WG H20 at the Berkeley meeting. No new activities were proposed at this meeting. The list now comprises:

- Alex Apostolov – Functional testing of IEC 61850 based systems.
- Eric Udren - Object definitions (items of information to communicate) for condition monitoring of protection systems (secondary systems). The objects are intended for incorporation in IEC 61850-7 (or other communications means) to support compliance with a NERC PRC-005-2 or other condition based (failure self-reporting) maintenance program for a protection system.

New business:

WG H15, Coupling Redundancy for Protection Systems Using Power Line Carrier, has completed its paper, to be circulated for SC approval after the January meeting.

WG H20, Standard for Naming Time Sequence Data (TSD) Files, is submitting its Draft #2 of *IEEE Standard for Naming Time Sequence Data Files* for SC approval and Main Committee vote to transmit to IEEE SA.

**Reports from the WG Chairs**

### H1: Guide for Power System Protective Relay Applications over Digital Communication Channels

**Chair: Marc Benou**
**Vice Chair: Ilia Voloh**
**Output: Guide**
**Assignment:** Develop a guide for application of digital communications for protective relaying systems and schemes, including transmitting and receiving equipment, digital channels, application principals, performance, installation, troubleshooting, testing and maintenance.

The H1 working group met with 3 members and 5 guests, including the guest chairman, M.P. Sanders. After introductions, an older agenda with the IEEE patent policy was distributed.

Due to the weather issues with the meeting, quorum was not reached. Jim Ebrecht forwarded draft 2.6 to the guests present.

The extension of the PAR was successful, therefore will expire in 2012 now. The status of the guide is that most of it has been written and the WG needs to review the document in earnest. There is still one large section that we have asked Bryan Donaldson of BPA to write on audio circuits as he is an expert on this.

The members present agreed to try the monthly web meeting as proposed by Chairman Benou.

Repeating again from last meeting minutes is the reminder for assignments:

It was urged to the group that while reviewing, to please consider not only editing and content but also to point out if the section discusses the pros and cons of that section and to point out any references or items for the bibliography. Also, to make sure all units are in metric units first and English units as an secondary option.

The following sections were reviewed or in some way modified:

- Section 7.4
- Section 7.5 (need drawings review)
- Sections 7.6-8.
- Section 8 needs drawing (Mal to follow up) and also pilot wire and phase comparison sections need few sentences on how this can be accomplished via digital channels-Mark Simon agreed to write few sentences.
- Section planning is summarizing all channels available but it's not really talking about planning of these channels).
- Ken Fodero and Roger Ray were unable to attend and are asked to review sections 4 and 6 respectively to approve the changes that have been made to the sections they authored.
- Assignments from previous meeting were not accomplished. The assignments were as follows - we remind it again:
- Section 5, Current section 7.6(to become 7.4.5), and section 8 – Rene Midence
- Sections 3, 4, 6, 7.2-7.2.4, 7.3 – Mike Stojak
- Sections 3, 4, 6 – Sarah Bins
- Sections 5.3, 7.4 – Johan Van den Berg
- Sections 7-7.145, 7.8, 9 – Tom Dahlin
- Sections 7.5, 10.1, 10.2 – Jim Ebrecht
- Sections 7.7, 10 – Mark Simon
- Sections 7.7, 9 – Benou
- Sections 8, 10 – Bob Ince
- Section 9 – Solveig Ward

Anyone else willing to review and not able to attend the meeting is encouraged to do so.

**H2:** **<u>Relay Applications Using the Smart Grid Communications Infrastructure</u>**
**Chair: M. Simon**
**Vice Chair: G. Antonova**
**Output: Report to the Subcommittee on title subject**
**Assignment:** Create a working group report to the Relaying Communications Subcommittee that describes example protective relay applications that can make use of the communication infrastructure provided by the Smart Grid. Protective relay applications will include potential capabilities and the communication requirements necessary to provide suitable communication architectures, services, capabilities, and any other pertinent characteristics.

H2 met on Tuesday January 11th 2011 with 30 people in attendance - 10 members and 20 quests. This is not a standards effort that requires a quorum. But, we would like to see more members in attendance to achieve a higher level of consensus. Charles Sufana acted as the chair for the meeting as Mark Simon was not able to attend. Chris Huntley acted as the vice chair for Galina Antonova as she was not able to attend. Both Mark and Galina were able to be in on a

conference call for the meeting and thus were able to address issues that popped up in the meeting.

The group quickly reviewed the purpose, outline and applications that will make up the document. The working group then proceeded to fill in a comparison matrix of the importance for the various functions being reported in the paper. Mark Simon was asked to provide a definition used in column 1 (application functions) of the matrix. After review of what was developed today for the matrix, Mark will provide the working group the final version as well as a list of definitions.

Anyone that would like to see a copy of the draft, please contact either the chair or vice-chair.

**H3: <u>Timetagging in Protection and Disturbance Recording IEDs</u>**
**Chair: W. Dickerson**
**Vice Chair: J. Hackett**
**Output: Recommended Practice**
**Assignment:** Develop a recommended practice for time tagging of power system protection event, analog, and derived data. This will include methodology for description of measurements and transport delays and for stating the resulting time accuracy.

The WG met on Tuesday January 11, 2011 with 9 members and 12 guests in attendance, including 2 guests from IEEE SA.

Most of the meeting was spent discussing the possibility of adding the Substations Committee as a co-sponsor. Tim Tibbals, Substations C7 Chair, expressed concern about the wide-ranging scope of the working group, and indicated that their willingness to participate was linked to modifying the scope and purpose to a more manageable level.

Considering our relative lack of progress, the repetitive nature of WG discussions and the priority status of this effort under SGIP, the WG decided to work on a modification to the PAR in accordance with the recommendations of the Substations Committee and our own experience. Tim Tibbals will work with the Chair and Vice Chair of the Working Group to accomplish this by the next meeting.

**H4: <u>Revision of C37.111 COMTRADE Standard</u>**
**Chair: R. Das**
**Vice Chair: A. Makki**
**Output: Standard**
**Assignment:** Revision of IEEE Std C37.111-1999 - IEEE Standard Common Format for Transient Data Exchange (COMTRADE) for Power Systems.

The WG did not meet in Atlanta due to travel challenges. No further report was provided. The Standard draft is completed (Draft 8.0). The standard is already in progress towards Dual Logo IEEE-IEC standard (C37.111 and 60255-24). The WG chair announced via e-mail during meeting week that the WG will organize a Web meeting or teleconference during the first/second week of February to go over the ballot comments. The Chair will circulate the balloting results during January to be discussed during this meeting.

**H5-a: <u>Common Data Format for IED Configuration Data</u>**
**Chair: J. Holbach**
**Vice Chair: D. P. Bui**
**Output: Report**
**Assignment:** Define a common format for IED configuration data.

Due to travel challenges, the WG leadership could not reach Atlanta and no meeting was held. No further report was provided. The WG Chair proposed to schedule a phone conference shortly after the meeting to coordinate future activities.

**H6 <u>Substation Ethernet</u>**

**Chair: C. Sufana**
**Vice Chair: TBD**

**Output: Report**
**Assignment:** Investigate user requirements and provide recommendations for relay peer-to-peer communications in substations. Develop and define practices for the application and testing of IEC 61850 based Ethernet protocol in substation LAN peer-to-peer applications.

Introductions were done after a welcome by Vice Chairman Charles Sufana. There were 10 members and 18 guests present. The minutes from the September 2010 meeting were approved. Charles Sufana indicated that as John Burger will not be attending the PSRC meetings in the future, he will be taking over the chair for H6 with H sub-committee approval. Charlie also asked for someone to volunteer to be the vice chair but no one volunteered.

Christoph Brunner was able to give the working group the status of the IEC-61850 work that is on-going. Christoph indicated that the major work for edition 2 for the most part has been completed. Parts 6, 7.2, 7.3, and 7.4 have been issued. Part 7.1 is almost done. Working Group 10 (Condition Monitoring) is publishing Technical Report 90-3. Technical Report 90-5 on Synchrophasors is almost complete. A report on mapping GOOSE to a routable GOOSE is being prepared with the hopes to have a draft done by early March and the final draft near the end of April.

Christoph also updated everyone on several other working groups. Working Group 17 is developing models for distribution generation and automation with emphasis for smart grid. It is hoped to have a technical report on distribution automation published the first half of the year. Three major sections are being developed: inverters and scheduling, electrical vehicles, and batteries. Working Group 18 is working on edition 2 for a standard on hydro. Christoph has provided a more complete report to the H subcommittee and his more extensive notes will be found there.

Steve Thompson then gave a presentation on an Inter Operability Research Project. The project had several central objectives for interoperability: identify issues, standardization and guidelines. The project was from September 2008 to March 2010. Steve indicated that the test report is available; contact him if a copy is desired. The paper may also be found in PACworld magazine.

Steve indicated that for the most part, the testing was successful but that it did require coordinated engineering. The testers determined that the various manufacturers had different ways to interpret the applications and so there were some minor issues. He also indicated that they did forward comments to Working Group 10 of what they found.

During the course of Steve's presentation a gap was identified that perhaps H6 could do a report on. There seems to be a need to have testing procedures for Applications. Mladen Kezunovic commented that there is a need for how one specifies the test requirements. Charlie requested that everyone think about what a paper might have and to offer suggestions at the May meeting.

Other potential activities:

1. Pierre Martin reported that there is a report from Spain done by a group of utilities that is called E3 Group on IEC-61850. The group has been developing specification documents that may help IEC 61850 'get down-to-earth'. The link is https://sites.google.com/site/e3groupiec61850.
2. John Tengdin suggested that to make H6 more visible that some of the earlier published papers on Ethernet based substation control that various H6 members have done could be put on the website.
3. Christoph Brunner indicated that he might be able to present a future talk on what has been done in Australia.
4. Dean Ouellette from RTDS told H6 that there was an upcoming UCAIUG interoperability demonstration coming up in the very near future in Paris. The GOOSE messages will have different formats. Dean indicated that he might able to have a presentation on the demo at one of the future H6 meetings.

5. Stan Thompson from Megger indicated that he might have a presentation on GOOSE tests done in Mexico.

**H7** **IEEE 1588 Profile for Power System Applications**
**(Joint Working Group of Substations Committee C7 & PSRC H7)**
**H7 Chair: Galina Antonova** **Substations C7 Chair: Tim Tibbals**
**Vice-Chair: Bill Dickerson**
**Output: Standard**
**Assignment:** Develop an IEEE Standard "IEEE Standard Profile for Use of IEEE 1588 Precision Time Protocol in Power System Applications" in close coordination with IEC TC57 WG10 and other technical committees with similar interests.

Joint WG H7/Sub C7 met on January 12, 2011 in Atlanta, GA in a double session with 40 attendees (13 members and 27 guests). Eight attendees (4 members and 4 guests) called in and participated via on-line meeting. Quorum was achieved.

After introductions, co-chair presented IEEE Patent Policy slides and asked to bring up any patent issues. None were identified. Minutes of September 2010 meeting were approved.

Discussion on IEEE Sponsor ballot comments followed. The group agreed to

- IEEE 1588 TLV format for Alternative Timescale TLV
- One Alternative Timescale TLV (and consider the need and mechanism to support multiple such TLVs)
- Assign blocked MAC Address to Announce messages (also used for PDelay messages)
- Support TimeQuality attribute to be provided by all clocks.

Discussion on next steps and new items followed, including remaining comments resolution, recirculation and submission to RevCom for approval.

**H8** **Application of COMTRADE for Exchange of Synchrophasor Data**
**Chair: E. Allen**
**Vice Chairs: J. Ingleson, K. Narenda**
**Output: WG Paper**
**Assignment:** Develop a paper on 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.

This WG met on January 11 at 11:00 AM in Atlanta, GA. 4 of 15 Members were present. There were 17 guests, for a total attendance of 21. A winter storm across the South adversely affected the ability of WG members to reach the meeting.

The COMTRADE files provided by Ken Martin from the schema testing were reviewed. The file set represents a five minute period of ambient data. Frequent dropouts were observed in the data; however, it was found that the status channels specified by the schema (DTVLD and PMUERR in particular) adequately indicate the presence of those dropouts. However, it was noted that the ordering of the status channels in Ken's files did not conform to the schema. Ken agreed to modify the program used to generate the files so that the status channels would be numbered according to the specifications in the schema.

Benton Vandiver and Jay Murphy were unable to attend the meeting in person due to weather-related flight cancellations. Both reported progress in implementing the test of the schema prior to the meeting; however, they did not have COMTRADE file sets available for review at the meeting.

Stan Thompson of Megger offered to perform a test of the schema as well using Ken's phasor data. Ken will send those phasor data files to Stan.

Following are status reports on various outstanding assignments having to do with the publicizing of this Schema:

The submittal to the Texas Relay Conference was rejected by the selection committee. Mladen Kezunovic agreed to try to find out the reasons for the rejection by talking to members of the committee.

Eric Allen presented the schema to the Western Protective Relay Conference (WPRC) on October 21. The presentation appeared to be well received.

The version of the schema approved by H subcommittee on May 13 has been included as an informative annex of the new COMTRADE standard. It is believed, but not known for certain, that the recent problems with the COMTRADE draft having out-of-date and erroneous text have been corrected.

The WG will endeavor to complete the schema testing plan by e-mail in the next couple of months. If this is done, then the group's assignment will have been completed and the WG can vote by e-mail to disband prior to the May PSRC meeting in Asheville, NC; otherwise, a meeting of the WG will be held there.

**H9** **Understanding Communications Technology for Protection**
**Chair: M. Sachdev**
**Vice Chair: R. Midence**
**Output: WG Paper**
**Assignment:** Prepare a document that would assist engineers in understanding the communications technology for protective relaying.

The Working Group met on January 12, 2011 at 9:30 am. Ten (10) members and four (4) guests were present. The notes of the previous meeting were presented and discussed.

Status of the Report: For the benefit of new participants that attended the meeting for the first time, René Midence provided and overview of the Report, and presented a list of comments made to Draft 4 distributed after the previous meeting.

The list of comments received to date was presented and discussed during the meeting. René Midence described the new material and how it contributed to resolve some of the comments; however there is still work to be done that require the skills of individuals with experience in communications with good understanding of protection and control.

It was agreed that the document may have content that does not necessarily meet the objective of this assignment, therefore it will be removed from the main document and will be placed in appendixes rather as reference or for additional information.

René requested those present to assist with contributions to cover the comments or to provide the contact information of individuals that can provide contributions.

It was agreed that all the participants on this meeting will be taking the task of:

- Reading the entire document
- Provide comments if needed
- Provide contributions to feel the gaps or identify resources capable of providing contributions.

It was suggested in the previous meeting that Acronyms and Glossary be moved to the beginning of the document. René will take care of this.

René presented a table identifying the assignments not received prior to this meeting. René will follow up the corresponding group members.

Lilliana Vulic provided contributions to the "*Section 1 – Digital Communications"* and *"Section 2 – Basic Issues"*. She also volunteered to provide material that will facilitate the flow of information and the relationship between local area and the wide area networks.

The following members volunteered in September 2010 to read the document. René will contact them for their contributions.

- Shoukat Khan
- John Beckwith
- Sam Sambasivan

René Midence will contact Solveig Ward for comments on the sections containing information on SONET.

Target Date: New contribution and comments are due on April 15, 2011.

Future Plan: It was agreed that the document will be finished by the next meeting to be held in May 2011.

**H10 Naming Installed Intelligent Electronic Devices (IEDs)**
**Chair: R. Cornelison**
**Vice Chair: J. Hackett**
**Secretary: A. Makki**
**Output: WG Paper**
**Assignment:** Create a PSRC Report that describes a convention to uniquely identify (name) installed Intelligent Electronic Devices (IEDs) including measured and calculated quantities for the purpose of sharing data collected by these devices.

The Working Group met on Tuesday January 11, 2011 with 2 members and 4 guests.

The purpose of this meeting was to disband since the Working Group Chair forwarded the completed paper to the Subcommittee Chair last week. The Working Group had been able to complete this work earlier than expected due to the extensive use of email reviews led by the Chair.

Due to a lack of quorum caused by the snow storm, we plan to poll the members by email to seek agreement to disband. The Chair will communicate the results to the Subcommittee Chair.

**H11 C37.118.1 Standard for Synchrophasors for Power Systems**
**Chair: K. Martin**
**Vice Chair: B. Kasztenny**
**Output: Standard**
**Assignment:** Create a new Synchrophasor Standard C37.118.1, using the measurement portion of the current standard, C37.118-2005, and adding dynamic phasor measurement and frequency measurement requirements according to the PAR issued 17 June 2010.

WG H11 met on Wednesday, January 12 in a double session with 11 members, 7 corresponding members, and 28 guests. The attendees were reminded of the applicable IEEE intellectual property rules. The WG did not have a quorum, so was unable to conduct formal business, so it will be done by Email.

The present state of the standard was reviewed. A task team has completed reference algorithms that are described in annex C and used these to confirm performance requirements. All the figures have been updated and will be put into the next draft. IEEE-SA has offered to edit the draft into standard IEEE format when it is ready.

Representatives of the IEEE synchrophasor WG and the Chinese synchrophasor standard met to discuss harmonization of their standards. The IEEE standard focuses on measurement and data transfer and the Chinese standard focuses on data transfer and system management. The Chinese intend to use the measurement provisions from 37.118.1. They provided translations of 4 sections from their standard for consideration of inclusion into the IEEE standards. Based on recommendations of the correspondence group, the WG considered the generator monitor section and agreed to add it as an annex with some edits. The issue of copyright was brought up and Ken will get a copyright release from the Chinese delegation. Gabriel mentioned that he is aware of patented methods for generator monitoring shaft sensors; he will investigate and report back to the WG.

IEEE proposed 37.118.1 to IEC TC95 for a dual logo adoption. They decided they preferred a joint development. Due to the advanced state of the draft and the Smart Grid Initiative urgency, it was decided for IEEE to continue completion of 37.118.1 and start the joint work with IEC at the same time. This is proposed to start in May 2011 if the new work item circulated by IEC is approved. If approved, the IEEE will need to recommend some names for the work group. If you are interested in taking part in this work, contact Ken Martin for details.

The chair mentioned that he hoped to bring the standard to a final approval vote at the meeting. It was mentioned that in the past, WGs have circulated a final draft along with the vote so members could examine and make final comments on the draft before it goes to the subcommittee. In this case, the issue was moot due to lack of quorum, but this will need clarification for the future. The current plan is to circulate the draft with the determined updates and then circulate again for final vote.

A few issues in the current draft were discussed and resolved including difficulty with computation of F and ROCOF, the term out-of-band, and some measurement limits.

The Chairman will provide an updated draft including these changes to the working group by January 31, 2011 and ask the WG for the comments and to motion the H Subcommittee for permission to send the draft for IEEE SA balloting.

**H12: <u>Configuring Ethernet Communications Equipment for Substation Protection and Control Applications</u>**
**Chair: E.A. Udren**
**Vice Chair: J. Gould**
**Output: WG Report**
**Assignment:** Develop a report to assist protection engineers in configuring Ethernet LANs and networking equipment when the network traffic includes critical protection messaging such as IEC 61850 GOOSE messaging. Topics include switch and router configuration, VLANs, security, priority queuing, traffic monitoring and control, and topology choices and redundancy.

The Working Group met on January 12, 2011 with 6 members and 14 guests. Attendees reviewed Draft 10 of the WG paper, with new additions and editing. The draft has a full body of material with a few identified spots to fill in. The WG reviewed the draft and identified remaining assignments, to be handled by volunteers in attendance and via prior assignments. Draft 10 is circulated after the meeting for WG review and these additions in March.

The schedule is to have the holes filled and issues addressed by May, with paper ready in September. All members and attendees are asked to review and mark up Draft 10.

Report work topics:

- Items still missing as identified in Draft 10.
- IEEE 1588 impact, advantages and disadvantages.
- Words on synchrophasors over Ethernet.
- Addition on approaches to multiport relays with bumpless network failure handling – PRP, HSR – digest from 61850-90-4 draft - Pierre Martin, Lars Frisk.
- Pointer to contents of new IEEE 1615 – Mike Dood
- 61850 stacks – layer 2 GOOSE and Sampled Values illustration versus 7-layer services – Schneider participant.
- Security aspects of IPv6 – Schneider participant
- Routers & dynamic routing – Richard Harada and Abdul Amin.

**H13 <u>Understanding Requirements and Applications of the Substation Cyber Security Standards</u> (Joint Working Group Substations Committee C1 & PSRC H13)**
**Chair H13: Steven Kunsman Chair C1: Sam Sciacca**
**Vice Chair H13: Tuan Tran**

**Output: Standard**
**Assignment:** Prepare a standard on "Cyber Security Requirements for Substation Automation, Protection and Control Systems." This document provides technical requirements for substation cyber security. It presents sound engineering practices that can be applied to achieve high levels of cyber security of automation, protection and control systems independent of voltage level or criticality of cyber assets. Cyber security includes trust and assurance of data in motion, data at rest and incident response.

The WG H13 and Substations WG C10 meeting was held on Wednesday, January with 30 attendees, 12 members and 18 guests, plus some IEEE-SA Staff. No quorum was established so the minutes will have to be approved via email. The group also went over the IEEE patent policy.

Updates were given by John Tengdin on IEEE-1711 (approved by IEEE-SA) and Sam Sciacca on IEEE-1686 (being opened for revision)

The PAR was approved in the December IEEE-SA Board meeting, and this effort has been identified as a candidate for accelerated IEEE-SA processing for NIST Smart Grid inclusion. Noelle Humenick indicated that assistance could be available, including a staffer to serve as the primary administrative functionary. Steve and Sam will discuss with Noelle the needs of the group to move the effort along.

A schedule of the effort was proposed which would have submittal to RevCom in September 2011. This will require teleconference meetings (possibly three) in advance of the May meeting.

The project will be set up in My Projects with a Mentor site to facilitate the accelerated effort. Writing assignments, reviews and other activity will be posted to Mentor with access by all WG members.

Draft 1 was circulated and additional writing assignments were made. The next 3 meetings will be teleconference meetings, with a possible fact-to-face in Piscataway in March.

**H14** **Revision of C37.115 Message Communications Between IEDs**
**Chair: J.T. Tengdin**
**Vice Chair: TBD**
**Output: Standard**
**Assignment:** Recommend whether C37.115 is to be revised or retired.

H14 did not meet in Atlanta. H14 was placed in an inactive status at the prior September meeting, until the elapsed times (T1, T2, and T3) now in that standard's Figure 1 can be measured. A Working Group of the PES Substations Committee's C Subcommittee is beginning work on a method to measure these times (or their equivalent). IEEE C37.115 has been removed from Active status. Until a valid measurement method is defined, IEEE C37.115 will remain as Inactive.

**H15** **Coupling Redundancy for Protection Systems Using Power Line Carrier**
**Chair: R. Ray**
**Vice Chair: B. Pickett**
**Output: Paper**
**Assignment:** To develop a working group report that discusses the various coupling schemes for power-line-carrier systems and the coupling schemes ability to provide for redundancy.

H15 did not meet at the January 2011 meeting.

The paper is complete and Draft #6 has been put out (via email) for a ballot from the working group. The working group has until January 28th to send in a response.

When I get approval from the working group I will ask the H subcommittee to do an email ballot. This has to be done long before the next meeting since this paper has been accepted for presentation at the 2011 Georgia Tech Conference.

**H16** **Common Format for Event Data Exchange (ComFEDE)**
**Chair: M. Adamiak**

**Vice Chair: P. Martin**
**Output: Standard**
**Assignment:** Define a standard for a common format for the data files needed for the exchange of various types of power network events.

The IEEE Standard for a Common Format for Event Data Exchange – COMFEDE – IEEE C37.239 – is complete, approved, and published as a full standard. It is anticipated that updates to the Schema will be required over the course of the standard. The WG plans to create a Transaction paper and a Conference paper. A first-draft PowerPoint is already available. An outline has been prepared and writing assignments have been made. A draft is planned for mid-April with a final review at the May PSRC.

**H17 <u>Establishing links between COMTRADE, IEC 61850 and CIM</u>**
**Chair: C. Brunner**
**Vice Chair: A. Apostolov**
**Assignment:** Develop a standards approach to link IEC 61850, CIM and COMTRADE so that the COMTRADE channels can be associated to a node in the power network.

The meeting was held Tuesday afternoon as a single session and attended by 5 members and 11 guests. The Vice Chair was missing due to flight conditions into Atlanta as well as the video projector.

After introduction of attendees Christoph made a very short introduction of the scope of the working group since there attended a couple of new participants.

The scope was discussed and Mladen Kezunovic made the remark that COMFEDE should be considered as well. Mladen as well pointed out that we shall include migration scenarios – e.g. we shall show what users have to do to benefit from the approach even if they do not yet fully apply IEC 61850 or CIM.

In a next step, Christoph went through the outline of the draft that has been prepared at the last meeting. Mladen pointed out that a practical use case may involve the need to analyze data coming from different sources like data from relays in COMFEDE format, data from disturbance recorders in COMTRADE format and data from a file following the file naming convention that need to be merged with data from SCADA.

Then, existing assignments where reviewed and new assignments where made. As new assignment, a couple of members volunteered to provide a write-up:

- Mladen Kezunovic to describe the use case for fault location based on COMTRADE file analysis. He will incorporate into the presentation of that use case as well the issue of the need to analyze data from different sources as explained above.
- Jalali Mansour to describe the use case Condition monitoring / Analysis based on COMTRADE records of condition related information.
- Stan Thompson to describe the use case of System simulation and testing replaying COMTRADE information.
- Arvind Chaudhary to describe the use case of correlating COMTRADE data with any information recorded elsewhere like e.g. weather data.
- Pierre Martin to provide a short description of COMFEDE.

**H18: <u>Cyber Security for Protection Related Data Files</u>**
**Chair: Amir Makki**
**Vice Chair: Stephen Thompson**
**Output: Report**
**Assignment:** Develop a report on security for data files used for configuration, management, and analysis of protective relaying systems.

The H18 working group met on January 12th 2011 with 4 members and 8 guests present. The meeting was chaired by Stephen Thompson. Charles Sufana recorded the notes. Introductions were made and minutes of previous meeting were approved. A quick review of the table of writing

assignments from the previous meeting took place. Individual writing assignments received since the last meeting were then reviewed. Most were accepted with some minor revisions required to some. Two new file types were added to the assignment list with a volunteer who will write a contribution for these. Additionally a section describing Role Based Access Control and its applicability to file security shall be added and a volunteer agreed to provide this. It is felt that this group is well on the way to complete the report by the next meeting in May 2011.

**H19** **C37.118.2 Standard for Synchrophasor Data Transfer for Power Systems**
**Chair: Ken E. Martin**
**Vice Chair: Gustavo Brunello**
**Scope:** This standard defines a method for exchange of synchronized phasor measurement data between power system equipment. It specifies messaging including types, use, contents, and data formats for real-time communication between Phasor Measurement Units (PMU), Phasor Data Concentrators (PDC), and other applications.

WG H19 met on Wednesday, January 12, 2011 in a double session with 9 members and 18 guests. A quorum was not present. The participants were reminded of the applicable IEEE intellectual property rules. The chair gave a brief overview of this Standard, and its present status.

Config3 was approved by the WG via an electronic ballot last year with 2 negative votes and some other comments. The attendants to the meeting addressed these issues and after extensive discussions decided:

1. Latitude, Longitude and Elevation will be referenced to WGS84 and reported using IEEE 32-bit floating point.
2. Naming for Channel Name (CHNAM) and Station (STN) will be using UTF-8 coding that includes most current languages
3. Mark Adamiak will prepare an Informative Annex describing the use of a “Pseudo PMU” which captures PDC information so it can be forwarded along with PMU information in the data. Due date for Mark to submit it: Jan 26, 2011
4. Reporting Freq and ROCOF when they are out of the PMU measuring range were discussed. Some PMUs have settable reporting ranges and others quit reporting at fixed reporting limits. The suggestion to add the reporting limits to config3 was considered and declined.
5. The proposal to add informative Annex from the Chinese Synchrophasor Std was discussed. The attendants decided not to include any in this standard because they are more application specific or belong in C37.118.1.
6. There was extensive discussion about the PMU message Time Quality. The attendants decided to use Bits 6 – 9 of STAT field originally reserved for security. They would not be particularly useful with modern security codes and their use allows a fully backward compatible inclusion of time quality for each PMU that will also be aligned with modern timing systems. The WG chose a TQ code that is consistent with IRIG-B and 1588.
7. The addition of Locked Time Quality information for the IRIG-B profile in Annex F was debated. The proposal, developed with the help of H7 uses Bits P70 to P78 which are currently unused. Proposal A uses these bits only during the locked state and uses the existing TQ during an unlocked state. Proposal B uses these bits at all times to indicate TQ. The decision was to include this new TQ indication and follow Proposal B. This new TQ will be called CTL (Continuous Time Quality).
8. It was decided that the Annex E is no longer necessary and its content will be merged in Annex F.

The draft will be updated with these decisions and circulated to the WG for review. It there are no issues raised, the WG will be balloted for final approval.

**H20** **Standard for Naming Time Sequence Data (TSD) Files**
**Chair: Eric Allen**
**Vice Chair: Amir Makki**
**Output: Standard**
**Assignment:** Elevate C37.232, *IEEE Recommended Practice for Naming Time Sequence Data Files,* to a standard.

The H20 WG met on January 11 at 9:30 AM in Atlanta, GA. 4 of 6 Members were present. 3 guests were also present, for a total attendance of 7.

The C37.232 document, with revisions to reflect the proposed change to a standard, was reviewed by the group. A motion was made to submit this document for ballot and address any issues as ballot comments are received. The motion was approved unanimously by all members present.

**Liaison Reports**

**PES Substations Committee**
**S. Sciacca**

Substations Committee C0 is currently working on the following topics:

1. C1: Starting work on updating IEEE 1686 Standard For Substation IED Cyber Security. This work will be coordinated with SUBS C10/PSRC H13.
2. C2: Continuing work on IEEE 1613 Standard Environmental and Testing Requirements for Communications Networking Devices in Electric Power Substations to include better shock and vibration requirements. These new requirements the PSRC may want to consider adding to C37.90.
3. C3: Starting work on IEEE C37.1 Standard for SCADA and Automation Systems.
4. C4: Coordinating work with PSRC H3 for time tagging requirements of substation IEDs. This work came out of how to test compliance with 1646 and C37.115.
5. C8: Starting work on updating IEEE 1615 Recommended Practice for Network Communications in Substations. This work may be coordinated with PSRC H12.
6. C12: Continuing work on IEEE 1815 DNP3.
7. C14: Starting work on IEEE 1815.1 Standard for exchanging information between networks implementing IEC 61850 and IEEE Std 1815 (DNP3).

**PES Communications Committee**
**S. Klein**
No report.

**IEC TC57, WG10, 17, 18 and 19**
**C. Brunner**

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

(1) Preparation of Edition 2 of IEC 61850:

The parts 4, 6, 7-1, 7-2, 7-3, 7-4, 8-1 and 9-2 are published or circulated / ready for circulation as FDIS. From a technical viewpoint, they are done.

CDs for part 1 and 3 are currently being circulated. A draft CDV for part 5 is ready. Currently the French translation is in preparation. The first draft for part 10 is under preparation.

(2) There are different task force working on preparing technical reports:

a. IEC 61850-90-3 – using IEC 61850 for condition monitoring

b. IEC 61850-90-4 – network engineering guidelines

c. IEC 61850-90-5 – using IEC 61850 to transmit synchrophaser data according to IEEE C37.118. This is a joint work with IEEE PSRC HTF3.

d. Modelling of logics

e. Functional testing

For IEC 61850-90-5, a draft has been circulated to the national committees; currently the comments are incorporated into a second draft. The work is expected to be finished the latest by summer 2011. Drafts of IEC 61850-90-3 and -90-4 are expected to be circulated following the WG meeting in March.

(3) A draft UML model for IEC 61850-7-4 and -7-3 has been generated and is currently in the process to be verified. It is intended that for the future, the UML model shall serve as a basis for the standardisation work.

(4) Technical reports IEC 61850-7-5 and -7-500 are in preparation. These reports shall provide additional explanation on the usage of the models defined in the standard.

*IEC TC57 / WG17* is currently working on the following topics:

(1) A task force was created that shall prepare a technical report about the use of IEC 61850 for Distribution Automation. That task force will in a first step prepare a technical report IEC 61850-90-6, use of IEC 61850 for distribution automation.

(2) The WG is revising and extending the existing models for DER as they have been defined in Edition 1 of IEC 61850-7-420. Since some of these models have a high priority for Smart Grids, it was decided to start with the publication of technical reports with the new or extended models. Technical reports may be produced faster. The named space concept of IEC 61850 has been adopted so that technical reports can be identified as intermediate models.

The following technical reports are planned:

f. IEC 61850-90-7 – Photovoltaics and schedules
g. IEC 61850-90-8 – Electrical vehicles
h. IEC 61850-90-9 – Storage batteries

*IEC TC57 / WG18* is preparing IEC 61850-7-510: use of the logical nodes defined in IEC 61850-7-410 to model applications for the control of hydro power plants. WG 18 also prepared a CDV of the second Edition of IEC 61850-7-410 which is currently being circulated. That work is focused on refining the different details of the logical nodes based on experience with first implementation considerations.