IEEE POWER & ENERGY SOCIETY / SUBSTATIONS COMMITTEE

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2011 – 2012 Officers

C0: DATA ACQUISITION, PROCESSING, AND CONTROL SYSTEMS SUBCOMMITTEE
Chair: C. Preuss
Vice Chair: Vacant
Secretary: E. William Jr.

Meeting called to order by Chair, Craig Preuss. Introductions were made. There were 5 attendees (4 members and 1 guest). No voting took place, No quorum yet?

The following members were in attendance:	The following guests were in attendance:
Craig Preuss	Patrick Carroll
Edward J William Jr.	Matthew Ceglia (IEEE)
John Tengdin	Krista Gluchoski (IEEE)
Mike Dood	Erin Spiewak (IEEE)

Next Meeting

- January 9-12, 2012
    - PES JTCM Garden Grove, CA (near Anaheim)
- May 20-24, 2012
    - PES Substations Annual Meeting
    - Raleigh, NC
- September 10-12, 2012
    - PSRC September meeting
    - Portland, OR

Summary

1. John Tengdin will get in contact with the City of Anaheim; will talk with California contacts,

2. http://sequi.com/ was recommended for RF antennae contact Tien Van

3. Matthew (IEEE) – Talked of New PAR processes, send note to rev com admin to upgrade to full use status

4. John Tengdin will get in contact with Orange County PES chapter

5. John Tengdin will contact Tien Van of http://sequi.com/

6. Gave committee report, outline of substations C1-C14

7. Sam S. submitted PAR for 1686-2011 (2007 approved) – C1

8. Matthew Ceglia - IEEE P1904.1 Working Group

9. Standard for Service Interoperability in Ethernet Passive Optical Networks (SIEPON), http://www.ieee1904.org/1/index.html

C1:   IEEE 1686 Standard For Substation IED Cyber Security
Chair: S. Sciacca Sub: C. Preuss
Vice Chair: M. LaCroix
Secretary: E. William
Output: Standard
Expected Completion Date:

Meeting called to order by Chair, Craig Preuss. Introductions were made. There were 18 attendees (5 members and 13 guests). No voting took place, No quorum yet, **NEW MEMBERS?**

The following members were in attendance:	The following guests were in attendance:
Craig Preuss	Chang Yang
Didier Giarravano	Chris Huntley
Michael Dood	Eiji Oba
John Tengdin	Charles Sufana
Mason Clark	Yi Hu
	Allen Goldstein
	Justin Faith
	Adi Mulawarman
	Dan Nordell
	Alex Lee
	Bill Higinbotham
	Eric Thibodeau
	Edward J. William Jr.

Summary

1.   PAR Status: The PAR was approved at the SASB meeting in Seoul, Korea

2.   George Simar with Quebec – Craig will get to Sam

3.   Send 1686 copy to all as requested

4.   Review P1686

5.   Sam has not updated scope and purpose.

6.   Writing assignment? Anyone familiar with Encryption? How to add encryption into document? Volunteers?

   ●   Charles Sufana will send H18 document to help. He will send via email. C10-H15 document on Wednesday Steve Salmon.
   ●   Craig will follow up with Stan Klein to help start with Encryption
   ●   Mark Simon wrote definitions of securities in draft of 1614

Future Meetings:

     Anaheim, CA, January 9-12, 2012 (JTCM), Hotel Hyatt Regency Orange County

     Raleigh, NC, May 20-24, 2012 (PES Substation annual meeting)

     Portland, OR, Sept 10-13, 2012 (PSRC)

C2: **IEEE 1613 Standard Environmental and Testing Requirements for Communications Networking Devices in Electric Power Substations**
Chair: J. Tengdin
Vice Chair: L. Smith
Secretary: E. William (acting)
Output: Standard update
Expected Completion Date:

Meeting called to order by Chair, John Tengdin. Introductions were made. There were 21 attendees (13 members and 8 guests). No voting took place, No quorum yet, **No NEW MEMBERS?**

The following members were in attendance:	The following guests were in attendance:
John Tengdin	Edward J William Jr.
Michael Dood	Eric Thibodeau
Bill Moncrieff	Jay Murphy
Bill Higginbotham	Dac-Phoc Bui
Mark Simon	Krista Gluchosk
Mario Ranier	Ken Fodero
Bob Beresh	Brian Muglian
Craig Preuss	Neil Saia
Mathew Ceglia	
David Haynes	
Jim McGhee	
Didir Chem-Foy	
Dan Nordell	

Summary

1. Matthew Ceglia (IEEE) will head action item of following up with Editors on topic discussed.

2. John Tengdin will follow up with C37-90 in response to Matthew Ceglia

3. Matthew Ceglia and John Tengdin will need to have offline call to follow up on editing in respect to C37-90.1

4. Email ballot needed since no quorum

5. IEEE standard association decreed risk of having confusion due to changes. Should reference only and have our own pass fail criterion for acceptance. Change scope form substation to electric utility facilities

6. Mathew Ceglia and John Tengdin will need to have offline call to follow up on editing in respect to C37-90.1

C3:   IEEE C37.1 Standard for SCADA and Automation Systems
Chair: C. Preuss
Vice Chair:
Secretary: E. William
Output: Standard

Meeting called to order by Chair, Craig Preuss. Introductions were made. There were 14 attendees (5 members and 9 guests). No voting took place, No quorum yet, **NEW MEMBERS?**

The following members were in attendance:	The following guests were in attendance:
Craig Preuss	Chang Yang
Edward J. William Jr.	Chris Huntley
Michael Dood	Eiji Oba
John Tengdin	Charles Sufana
Wai Tsang	
	Mason Clark
	Allen Goldstein
	Justin Faith
	Adi Mulawarman
	Dan Nordell

Summary

1. Adi Mulawarman (Guest) Volunteered to diagram for interfaces by 13-Jan-2012
2. NISTIR should be reference to C37.1. NISTIR needs some corrections
3. Future Meetings:
    a. Anaheim, CA, January 9-12, 2012 (JTCM), Hotel Hyatt Regency Orange County
    b. Raleigh, NC, May 20-24, 2012 (PES Substation annual meeting)
    c. Portland, OR, Sept 10-13, 2012 (PSRC)
4. From Substations meeting in Chicago in May, Strive for 90% "Shall" and 10% "Should" in C37.1 document.
5. Currently no guideline for how document should be tested.
6. C37.01 makes it the mandatory testing requirement.

7. *Discussion was performed on C37 document.*

8. Change C37.1 to discuss more along NISTIR (7628) concepts – We come up with concepts and address standards and C37 that can describe security around interfaces.
9. There is currently problem trying to fix C37.1. Received negative ballots about document as a whole has too many "should" and not enough "shalls". Vendors can't use as standard.

C4: **IEEE XXXX Draft Standard for SOE Time Stamping Requirements for Substation IEDs**
Chair: M. LaCroix
Vice Chair:
Output: Standard

C5: **IEEE C37.2 Draft Standard for Electrical Power System Device Function Numbers and Contact Designation**
Chair: J. Tengdin
Vice Chair: W. Ackerman
Output: Standard

The C5 working group did not meet.

C6 **Trial Use Standard for a Cryptographic Protocol for Cyber Security of Substation Serial Links (P1711)**
Chair: D. Whitehead
Vice-Chair: Andrew Wright
Output: Standard

The C6 working group did not meet.

C7 **IEEE 1588 Profile for Power System Applications**
Chair: T. Tibbals
Vice Chair: M. Dood
Output: Standard
Established: 2009

C8 **IEEE 1615 Recommended Practice for Network Communications in Substations**
Chair: J. Gould
Vice Chair:
Secretary: E. William (Acting)
Output: Standard
Established: 2011

Meeting called to order by Chair, Craig Preuss. Introductions were made. There were 20 attendees (5 members and 15 guests). No voting took place, No quorum yet, **NEW MEMBERS?**

The following members were in attendance:	The following guests were in attendance:
Craig Preuss	Chang Yang
Didier Giarravano	Chris Huntley
Michael Dood	Eiji Oba
John Tengdin	Charles Sufana
Mason Clark	Yi Hu
	Allen Goldstein
	Justin Faith

	Adi Mulawarman
	Dan Nordell
	Alex Lee
	Bill Higinbotham
	Eric Thibodeau
	Edward J. William Jr.
	Mark Simon
	Mark Lacroix

Summary

1. C. Preuss Word document draft of standard

2. Mike Dood 8. - Change to include 1815 as DNP3

3. HSR – High Availability Seamless Ring, (IEC 62439)

4. PRP – Parallel Redundancy Protocol

5. Two benefits of HSR and PRP transparent to underlying Ethernet structure, Bump less

6. C9: IEEE 1646 IEEE Standard Communication Delivery Time performance requirements for electric power substation automation

7. IEC 61850-90-4 includes description of HSR and PRP. (Can we get access to get it?). Eric or Murdy is point of contact to get IEC 61850-90-4.

8. Check with IEEE-SA to see who can contact IEC 61850-90-4. If you mention it's a smart grid standard.

9. Browsed the 1615-2007 document 1615-2007.pdf

C9:   **IEEE 1646 IEEE Standard Communication Delivery Time Performance Requirements for Electric Power Substation Automation**
              Chair: J. Tengdin
              Vice Chair: D. Holstein
              Output: Standard
              Established: 2009
              Expected Completion Date: 2010.

              The C9 working group did not meet.

C10:   **IEEE PC37.240 Standard for Cyber Security Requirements for Substation Automation, Protection and Control Systems**
              Joint Chair: S. Sciacca
              Vice Chair:
              Output: Standard

Established: 2008
Expected Completion Date: Initiating joint work with PSRC H13.

C11: **IEEE 1379 IEEE Recommended Practice for Data Communications Between Remote Terminal Units and Intelligent Electronic Devices in a Substation**
Chair: L. Smith
Vice Chair:
Output: Recommended practice
Established:
Expected Completion Date:

C12: **IEEE 1815 IEEE Standard for Electric Power Systems Communications - Distributed Network Protocol (DNP3)**
Joint Chair: L. Smith
Vice Chair: A. West
Output: Standard
Established: 2009
Expected Completion Date: 2011

C12 met to discuss present status to add security.

C13: **IEEE C37.115 IEEE 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**
Joint Chair: J. Tengdin
Vice Chair:
Output: Standard
Established:
Expected Completion Date:.

The C13 working group did not meet.

C14: **IEEE P1815.1 Draft Standard for Exchanging Information between networks Implementing IEC 61850 and IEEE Std 1815 (DNP3)**
Joint Chair: L. Smith
Vice Chair: R. Farquharson
Output: Standard
Established: 2010
Expected Completion Date: 2012

Attending:

- +15 in Minneapolis (update pending)
- Andrew West
- Bruce Muschlitz
- Carlos Bustamante
- Christoph Brunner
- Eric Thibodeau
- Grant Gilchrist
- Joe Hughes
- Kunle Adeleye
- Lorene Cunningham

- Marcus Steel
- Panitarn (Joseph) Chongfuanprinya
- Vinoo Warrier
- Yi Hu
- Ed Cenzon
- Ron Farquharson

Discussed current progress

- <u>Ron discussed the IEEE patent slides</u>
- Ron reviewed the history of WG C14, document status and schedule
    - Draft ready for WG review by September 30
    - CSWG and SGAC reviews by September 30
    - Complete WG review by October 28
        - **ACTION: Ron to send ballot Group to Matt**
    - WG vote and approval by Oct 31
    - Ballot opening Nov 4
    - Andrew West - Document review can proceed in parallel with adding the XML example annex… they will also require review but should not alter the core document content. All were in agreement.
- Ron went over the minutes of the last meeting
    - PAR update needs to be done as soon as possible – Ron's pending action
    - Changes to 1815 have been sent to Lorene

Discussed updates to document

- Discussed Dave's email iec61850PathType (Section 9.5.3). Grant will add to document
- XML Mapping Example Questions
    - If you use DNP points to create a 61850 DA, no problem because reference is just someplace else in DNP XML
        - In other direction, 61850 point(s) to DNP, tool doesn't know which 61850 point to reference.
    - Second question, XPATH does not have bit operations. Necessary to change quality bit into BI values, or shuffle DNP quality to 61850 quality in a generic way. Need to define a generic function in XPATH.
        - Bruce says this functionality is already built in to XPATH (modulo functions), but is not elegant.
        - Might not be able to accomplish within character limit.
        - Optimization function is needed.
        - **ACTION: Bruce to contact Dave to discuss, and get back to WG.**
    - Grant's response to Dave's first question: Where to point the XPATH equation for mapping 61850 to DNP?
        - Element to use has 2 candidates:
            - DAI (Data attribute instance) or SDI (sub-data AI)
            - LNodes contained in IED… down to instance of LNode. Reference of LN Type in templates. Basic Data Attributes. But BDAs are no longer in an instance of LN. This is the part that

most people would fill out, but won't work because you don't know which one you are pointing at.

- Bruce: simple scaling factor equation (for example) the value in the server is multiplied by the scaling factor. How do you know whether this value is an XML element or a value inside the device? The value (5) may be several levels deep in the XML, and difficult to find.

- What format will the indirect references to the XML data elements be in?

- Dave may be asking several questions here. How do you map quality from DNP to 61850? How do you map the timestamps back and forth?

- Using Xpath as a specification , but it is not being used at all to look at text-based information.

- The execution of the xpath equation needs to be executed at runtime.

- Vinoo: I think the central issue here is to understand that the converter's internal process will not necessarily be using the XML file to do the runtime conversion of the data. The XML format is simply a configuration file that represents the nature of the conversion and mapping that is programmed into the gateway. This XML file will be used by system configuration tools to trace the origins of data in an offline manner.

  I think if the XPath can simply name the data items being mapped on both sides of the equation it should be enough, without worrying about the exact conversion.

  Also, Grant, it would not be a good idea to impose the creation of an DAI or SDI for every data element that is mapped. DAIs are simply meant to capture initialization time values and many attributes do not need a DAI.

- Point-to-point mapping is the goal, but it may be that the XPath is making things more complicated.

- Might the inclusion of detailed mappings be better left to 1815.1 version 2? But this may not provide much value to version 1 of the document.

- Vinoo:
  1) DNP XML XPath should not be considered as the runtime engine for protocol conversion. It is not required to express the details of the mathematics involved in converting data, in the XML file. The XML file is used for configuration, expressing the mapping and not for the actual runtime conversion which is a function of the gateway.
  2) XML formats still need to represent the unique unambiguous leaf elements on both sides (61850 and DNP3) of the equation, but only needs to show which elements are mapped to which. The XML should not try to perform the actual bytes and bitwise conversion of the runtime data.
  3) The existing chapter 9 constructs can be used to do just the above since we have a DNP3Path and IEC61850Data Attribute that represent individual elements. The "equation" part should be dumbed down to show which elements are related to each other and not do too much more than that.

- We may only need to define XML elements that includes lists of references, but not go into detail as to how they are mapped (do not need to specify the equations).
  If so, maybe we don't need Xpath, but some other kind of XML construct that allows us to map elements.
- Discussion tabled. We need to discuss this with either Jim or Dave present.
  - Ron proposed to present document status at next week's WG10 meeting
    - When to present
      - Tuesday afternoon 4:00-5:30 PM Switzerland (10-11:30 AM EDT)
    - What to present
      - **ACTION: Ron will ask WG 10 members what they would like to hear/discuss and reply to Ron by Thursday this week (email to Grant to copy WG members).**

Next meetings:

- WG C14 - Tuesday 4:00 PM Eastern, Sept.13 to continue today's discussion
- Joint meeting with IEC TC57 WG10 - Tuesday 10:00AM Eastern, Sept.20
- WG C14 - Monday 3:30 PM Eastern, Sept. 26 (next regular meeting)
- Agenda:
  - Present results of action items
  - Update schedule