

MINUTES

IEEE PES HVDC AND FACTS SUBCOMMITTEE MEETING

Time: 13:30 - 16:30 on Wednesday, July 30, 2014

Location: Gaylord National Convention Center: Camellia 2, Washington DC

Agenda:

1) Welcome and Announcements

Call to order at 1:35pm by Ben Mehraban, 47 members and guests attended

2) Introductions

Attendees introduced themselves

3) Approval of the July 2014 Meeting Agenda

Approved by acclamation with no modifications or additions

4) Approval of the Minutes of the July 24, 2013 subcommittee meeting

Moved and seconded, approved by acclamation

5) Working Group Reports

a) WG 15.05.02 Dynamic Performance and Modeling of HVDC Systems and Power Electronics for Transmission Systems

Ram Adapa reported: 54 attended. Working group producing position papers related to HVDC and FACTS applications. The WG will try to meet at JTCM or possibly have other phone or web meetings before the next PESGM. The working group considering submitting an IEEE paper on 12 bus system. There were four technical presentations at the WG meeting.

b) WG 15.05.08 HVDC Economics and Operating Strategies

Paul Marken (WG secretary) reported. 30+ attended the working group meeting. Aiming for putting together a special publication. The working group held a panel session on Monday, 12 presenters (originally had 15 presenters, asked 3 to not present). They had 70 people put down names on sign in sheet. Will probably hold another panel session at 2015 PESGM.

c) WG 15.05.14 HVDC and FACTS Education

WG held a panel session with an introduction to dynamic reactive compensation and an introduction to HVDC transmission at the Transmission and Distribution Conference and Exposition. Discussed putting together an IEEE E-learning tutorial based on that panel session. Attendees at the working group meeting encouraged the working group to try a panel at next GM.

d) WG 15.05.15 Use of Power Electronics in Major Grid for Generation Requirements

The working group has been disbanded. There were 3 who showed up for the meeting.

e) WG 15.05.17 Bibliography of HVDC and FACTS

Published 3 papers in the conference proceedings (Bibliography of FACTS Applications for Grid Integration of Wind and PV Solar Power Systems: 2010–2013, Bibliography of FACTS 2012–2013, Bibliography of HVDC Transmission 2012–13). They were presented at a combo-session with the working group as well as the Working Group on Education on HVDC and FACTS.

6) HVDC and FACTS Sub-Committee Website Update

Need to be updated to include presentations and minutes from 2013. The projects listing needs to be updated. Content is needed from the working group chairs. Johnson will work on it.

7) Award Committee Updates

- a) Uno Lamm Award Committee
Dennis Woodford reported: Prof. José Antonio Jardini from Brazil received the award. Involved Itiapu project. Several good nominations.
- b) Nari Hingorani Award Committee
FACTS award: Ned Mohan
Custom Power: Harshad Mehta
- c) George Karady recognized as distinguished member of CIGRE USNC meeting this week.

8) New Working Group Plans

- Andrew reviewed process initiated last summer.
- Requested proposals, received seven.
- Distilled ideas into common themes. Requested feedback from long term volunteers. Proposers invited to be chair or vice chair.
- Recommended topics
 - Planning for HVDC
Chair: Dr. Simon Teeuwsen and Vice Chair: Mike Henderson,
Discussion: Add multi-infeed applications
 - VSC HVDC Grid (Technology) Applications
Chair Dirk Van Hertem, Vice Chair: Dragan Jovcic, Geza Joos
Discussion:
 - Important to keep different from CIGRE topics
 - CIGRE and IEEE switchgear committees finally working together due to overlap of specialists between both so IEC documents close to IEEE. Hopefully can see some of that in HVDC.
 - be aware of what CIGRE doing so don't do needless work, complement them
 - VSC working group in substations.
 - Mike H: suggested conference calls or web in addition due to travel budgets

9) Reports of Substation Subcommittee

- a) Subcommittee I0, WG I4, WG I5, WG I8 and WG I9

Hubert Bilodeau presented:

- Chris Horwill became an IEEE fellow
- I4: planning a tutorial (SVC) at next GM in Denver.
 - Adding new materials and presenters (replace retired or deceased)
 - WG members all participating
 - Users list: 2011 version posted with some 2013 revisions.
 - Contact people at suppliers might be retiring
 - Reliability survey: 2006-2011, new and past users of SVC. Hoping for answers in fall.

- Panel session related to the survey, similar to refurbishment publication.
 - E-tutorial: Rajiv told them they could (1) film when record or (2) recording at own place. Would like feedback from experiences with HVDC & FACTS education working group.
- I5: VSC, Ben Mehraban is chair, Geza Joos vice-chair
 - Tutorial on Sunday at GM, 22 participated.
 - Functional specification of STATCOM standard in the works.
 - Handbook on VSC on application of VSC.
- I9: Protection of SVC
 - General review of documents
 - Testing
 - Overvoltage
 - PAR requires standard by 2016
- I8: PEBB
 - WG met yesterday to go over 2 TF activities
 - Dev of IEEE STD 1667: PEBB Architecture needs updating
 - Presentation Terry Ericson
 - Design tools for PEBB:
 - Document in early draft, conference call in January
 - See appendix B for a more detailed report.

10) HVDC Project Listing Update

- a) Having problems getting responses.
- b) CIGRE having similar problems getting responses
- c) Mark Reynolds can get information on projects completed/under construction in China
- d) A couple people suggested expanding the set of contacts
- e) Early planning projects more secretive that used to be.

11) Liaison Reports

- a) Overhead Lines - HVDC Line Design Guide TF

Ram Adapa

- HVDC design guide (Overhead Lines subcommittee). Draft of guide circulated for comment. TF met Tuesday at GM.
- At present guide goes up to 500 or 600kV. Discussion of adding 800kV (need input from practicing engineers working in it)
- Not covering cables

- b) CIGRE B4

Dennis Woodford

- HVDC and Power Electronics

- Convener Bjarne Andersen
- DC Grid-several working groups with short time window, most are nearly done (see B4 web page)
 - See B4 web page for list of the working groups.
 - Ram Adapa that mentioned that there is a WG on AC to DC line conversion, joint with CIGRE B2.
- c) General Systems Subcommittee: - TF on Electromagnetic Transients Modeling and Analysis of FACTS and HVDC VSC Converters
 - (1) Omar Farouque from Florida State on that group, he said will coordinate between the TF and with the working group on
- d) Other:
 - Mike Henderson: PSPI: Transmission planning WG→ some presentations on Smart Wire from Georgia Tech. Distributed SSC. Have one installation.
 - Ram: IEC TC 115: DC Voltage Standardization: come up with standard voltage class levels for DC, led by China and usually meet there
- 12) Dirk van Hertem arrived from paper session. Introduced himself
 - i) Plenty of work. Need to determine terms of reference and circulated
 - ii) Need to be able to work faster with due dates and deliverable
- 13) Presentations
 - a) Ram Adapa: Environmental & Interference Effects of HVDC Converters and Lines
- 14) General Reports on HVDC and FACTS Projects/Developments
 - i) The members and guests were provided with a forum to provide updates on HVDC and FACTS projects that they were presently working on
- 15) Location of the Next Meeting
- 16) Adjourn

Appendix A: Attendees:

First Name	Last Name	Company	E-mail Address
Ram	Adapa	EPRI	radapa@epri.com
Firouz	Badrkhani	University of Toronto	f.badrkhani@gmail.com
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Appendix B:

IEEE Power Engineering Society PES GM 2014 Washington, DC Summary Report

Entity: HIGH VOLTAGE POWER ELECTRONICS STATIONS SUBCOMMITTEE (I0)

Chair: Hubert Bilodeau
Vice-Chair: Dan Sullivan
Secretary: Joe M Warner

Subcommittee activities I0

The Subcommittee met at the Substations annual meeting in Portland April 2014. No meeting took place during the GM 2014.

Chris Horwill, past Chair of the Subcommittee received his Fellowship this year.

WG14 STATIC VAR COMPENSATORS (SVC)

Monday July 28- 13:30-17:00

Working Group Activities

SVC Tutorial – A tutorial is planned for the GM 2015. New authors have been selected to replace retired or deceased WG members. The deadline for the submission is August 15, 2014.

IEEE E-Learning - E-Learning tutorial process and format has been made much simpler. If the WG decides to go ahead with the E-Learning tutorial, the 2 following options are being examined.

First option, IEEE will allow our next Tutorial to video streamed while it is being delivered (remote attendees will be required to pay a fee)

Second option, IEEE will allow us to video stream the tutorial with each of the modules to be delivered by the speakers at any location (office, work, home, etc) as long as the date and times are coordinated. So essentially we will be delivering the tutorial similar to a webinar (at different locations). Attendees will pay a fee.

Reliability Survey - The Working Group requested in March from participating SVC users to report on forced outages from their SVCs during years 2006 through 2013. November 15 is the new deadline for the response. A panel discussion (2 hours minimum) is contemplated for the next GM 2015 depending on the data received for the reliability survey and the analysis performed. Information from panel papers will be combined with already gathered survey information to produce survey results publication. The deadline for the submission is November 21, 2014.

SVC Users List - The latest complete revision for the users list is 2011. Not all suppliers have responded for subsequent years up 2013.

2014 Panel session, T&D Show in Chicago – There were 8 presentations as part of the panel sessions. The topics included several recent successful applications of power electronics as part of the electrical power system (including FACTS) and presented advancement of FACTS controls, modeling, refurbishment, and renewable

energy applications.

The web site is up to date.

The next WG Meeting will take place during the JTCM meeting in January 2015.

WG I5 VOLTAGE SOURCED CONVERTER (VSC)

Tuesday July 29- 08:00-12:00

Working Group Activities

VSC tutorial - A tutorial has been presented on Sunday all day to 21 participants.

Functional Specification for STATCOM - P1052 Further progress was made and the discussion at this session focused on the VI characteristics for different hybrid solutions and Testing.

A HandBook on VSC Application based on the content of the work on the VSC tutorial is still being contemplated based on the existing Guide document and the tutorial material. The officers of the WG will discuss further in September on the best approach to be using depending also on the progress made on the current activities.

The web page has been updated.

The next WG Meeting will take place during the JTCM meeting in January 2015.

WG I8 POWER ELECTRONICS BUILDING BLOCK (PEBB) CONCEPTS

Working Group Activities

I8 Working Group – Power Electronic Building Block Tu 4:00 P 5:00 P

The working group met and reviewed the reports from the Task Force 1 and Task Force 2 meetings. The working group is planning to meet next at the PES GM in July 2015.

Task Force Activities

I8 Task Force 1 “P1667 Power Electronics Architecture” Monday 1:00 P 5:00 P.

Task Force 1 is now working on updating the Power Electronics Building Block (PEBB) Concepts (04TP170) due to progress made in the PEBB area by several manufacturers over the past decade. It was determined that the concept has evolved and changed enough since the 04TP170 document was produced to warrant an updated version.

During the Vancouver meeting of Task Force 1 the original PEBB concepts document was reviewed in order to determine key technologies that have developed since its publication. A plan was put forth to include the appropriate material in those sections as a path to achieving a rough draft of the new PEBB concepts document. The document as revised was reviewed and action items for continuing the revision were outlined. Terry Ericson gave a presentation on PEBB designs based on SiC. A discussion was held regarding the impacts of wide bandgap semiconductors and new converter topologies on the PEBB concept.

I8 Task Force 2 “Design Tools for PEBB Based Tu 1:00 P 3:00 P

Task Force 2 under Chairman Ani Gole is working on a Guide Project 1821: “Design Tools for PEBB based Systems”. The working group is currently entering the final editing phase of the guide. The PAR and task force document were reviewed and discussed. Although originally planned for the final draft by this meeting there are several outstanding actions items and new contributions that need review. It was decided to have a target date for the final draft review of December 2014. Assignments were made to the working group members for final review and final editing of the guide’s clauses.

There will be a telecon meeting of Task Force 2 in January 2015 in order to finalize some outstanding action items and to review the final edits assigned at the meeting.

WG I9 RECOMMENDED PRACTICE OF MODERN PROTECTION SYSTEM FOR TRANSMISSION STATIC VAR COMPENSATORS

Tuesday July 23- 13:30-17:00

Working Group Activities

PAR P1032 Recommended Practice of Modern Protection Systems for Transmission SVCs. The standard is being jointly developed with PSRC. General review, Testing and Overvoltage protection have been the topic of this session.

The web page has been updated.

The next WG Meeting will take place during the JTCM meeting in January 2015.

Submitted by: Hubert Bilodeau, Chair SCIO

Date: 2014/07/30