

**IEEE PES HVDC & FACTS SUBCOMMITTEE MEETING**

**2011 IEEE PES Summer Meeting**

**DRAFT Minutes of Meeting**

**27 July 2011, Detroit**

IEEE PES HVDC AND FACTS SUBCOMMITTEE  
2011 SUMMER MEETING  
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**IEEE HVDC AND FACTS SUBCOMMITTEE  
2011 MEETING**

**1 MEETING INFORMATION**

Time: 14:00 - 17:00 on Wednesday, July 27, 2011  
Location: Minneapolis Convention Center

**2 WELCOME AND ANNOUNCEMENTS**

Robyn Page welcomed everyone to the meeting.

**2.1 Executive Committee Changes**

Robyn introduced the subcommittee executive, which remain unchanged from 2010:

Robyn Page, Chairperson  
Ben Mehraban, Vice Chairperson  
Andrew Isaacs, Secretary

**2.2 Approval of the July 2010 Meeting Agenda**

The July 2010 agenda was distributed to the members and guests of the HVDC & FACTS Subcommittee who provided their e-mail addresses at prior meetings. The agenda was approved as issued (Motion made by Udaya Anakkage, seconded Narain Hingorani).

**2.3 Review of Previous Meeting Minutes**

Robyn Page reviewed previous meeting's minutes. Gene Wolf moved to approve the minutes, the motion was seconded by Narain Hingorani.

**3 INTRODUCTIONS**

The HVDC & FACTS Subcommittee members made introductions, and the sign-in sheet was distributed. A list of attendees and their contact information is provided in Appendix A.

**4 MEETING MINUTES – MINNEAPOLIS, JULY 28, 2010**

The minutes from the July 27, 2010 IEEE PES Summer Meeting were disbursed to members and guests via e-mail on July 26, 2011. The minutes were also posted on the IEEE PES HVDC & FACTS Subcommittee website. The July 27, 2010 minutes were approved as written.

## **5 WORKING GROUP REPORTS**

### **5.1 WG 15.05.02 - Dynamic Performance and Modelling of HVDC Systems and Power Electronics for Transmission Systems**

Ram Adapa provided a report for this working group.

The working group met at the Minneapolis meeting, with 25 attendees.

The working group is currently producing position papers for models which may be submitted as an IEEE paper.

- Paper #1: An outline was developed for position paper for EMT type models for LCC HVDC.
- Paper #2: EMT type modes for FACTS (not including HVDC, and not including VSC). This paper was published and is finished. (COMPLETED)
- Paper #3: EMT type models for VSC type FACTS. Draft report is finished and will be available at the next meeting
- Paper #4: EMT type models for VSC based FACTS. Draft report is finished and will be available upon request
- Paper #5: Wind integration position paper is on hold until 4<sup>th</sup> position paper is finished.

Benchmark test systems continue to be a main activity. An 8 bus system has been developed, headed by Ani Gole. Further work includes SVC, STATCOM, TCSC to be added to the test system. The test system will be available on website at future time. The large test system work has been completed. (Test systems include EMT, Stability, and Transient stability are all being compared using these test systems).

A technical presentation was given by Andrew Isaacs on planning studies being supplemented with PSCAD and ETRAN software tools.

### **5.2 WG 15.05.08 - HVDC and FACTS Economics and Operating Strategies**

Mike Henderson is the chair for this group. They are planning on presenting a panel session entitled "Everything Old is New Again". A further panel session is planned for 2013.

### **5.3 WG 15.05.14 Education on HVDC and FACTS**

Chair Brian Johnson provided a report for this working group which met together as a joint session with the Bibliography working group.

A panel session was presented at an earlier meeting this year, and a second session is planned for the T&D meeting relating to "HVDC Fundamentals". Brian asked for volunteers for presenters.

Brian is presented work and future work on "E-Learning".

#### 5.4 WG 15.05.15 Use of Power Electronics in Major Grids for Wind Generation Projects

Group met on Tuesday, July 26, 2011, and decided to introduce a panel for next Summer, identifying 5 topics for future challenges relating to power electronics and wind. A panel is also being presented at this (Detroit) meeting. The minutes from this working group are presented as follows:

1. **Introduction and presentations** – 20 attendees
2. **Acceptance of Agenda** – accepted
3. **Minutes of the last meeting** – July 28, 2010, Minneapolis, USA – read and accepted
4. **Panel session** – information and invitation to attend

*Interconnection and operating challenges of wind power using power electronics* (Panel Session, Transmission and Distribution Committee - DC & FACTS Subcommittee – Joint panel, Use of Power Electronics in Major Grids for Generation Requirements and HVDC and FACTS Economics and Operational Strategies), July 28, 2011, 8:00-10:00 am

*Modern Synchronous Condenser Performance Considerations*, Paul Marken, GE Energy; Arthur Depoian, GE Energy; John Skliutas, GE Energy; Michael Verrier, Transend Networks

*Sub-Synchronous Control Interactions Between Type 3 Wind Turbines and Series Compensated AC Transmission Systems*, Garth Irwin, Electranix Corporation; Amit Jindal, Electranix Corporation; Andrew Isaacs, Electranix Corporation

*AC or DC Power Modulation for DFIG Wind Generation with HVDC Delivery to Improve Interarea Oscillation Damping*, Lingling Fan, University of South Florida; Zhixin Miao, University of South Florida; Dale Osborn, Midwest ISO

*From Smart Grid to Super Grid: Solutions with HVDC and FACTS for Grid Access of Renewable Energy Sources*, James Feltes, Siemens Power Technologies International; Brian Gemmell, Siemens Power Technologies International; Dietmar Retzmann, Siemens AG - Transmission Power Solutions

*Potential Value of HVDC Overlays to Provide a More Reliable and Economical Power System*, Dale Osborn, Midwest ISO

5. **Working Group Scope and report** – next steps – options

**Scope:** To facilitate the anticipated 2020 North American Power Grid by transferring the knowledge to power plant developers and system planners.

**Original deliverables:** The WG focus will be to prepare reports for power plant developers to use in planning generation interconnections to the grid.

**Context - current:** There is a significant amount of activity in the areas covered by the original scope of the Working Group, namely renewable generation and specifically wind, and power electronics, in IEEE and CIGRE.

**Comments and consensus:** Refocus on educating the conference attendees in the latest issues and challenges associated with integrating renewable energy using power electronic systems. The purpose is to inform the technical public.

6. **Working group planned activities** – 2011-2012 – Panel

**Title** (tentative): *Interconnection and operating challenges of renewable energy using power electronics* (focus on operational strategies, challenges and special problems)

**Organization/responsibilities:** working group

**Invited speakers:** utilities, manufacturers and consultants (system studies), including committee members

Topics and tentative presentation titles:

1. Potential applications of HVDC for the integration of renewable energy
2. HVDC converter technologies and proposed installations – features and advantages
3. Instability issues in series compensated transmission systems connected to wind farms
4. Life cycle cost analysis for reactive compensation used in wind farm integration – comparisons between synchronous condensers and static compensators
5. Optimized embedded HVDC systems for improving transient stability in AC transmission systems

**Future panel topic:** future HVDC interconnections for offshore wind – technology and challenges. This topic was mentioned, but presenting papers on this was deemed premature.

7. **Other items** – None
8. **Next meeting** – PES GM, July 26, 2012, 13:00 – 16:00, San Diego
9. **Adjournment** – 14h30

Geza Joos, Chair  
July 27, 2011

## 5.5 WG 15.05.17 on HVDC and FACTS Bibliography

Rajiv Varma chaired a meeting for this working group in a joint session with the Education working group. The scope for this working group is to prepare bibliographies on HVDC and FACTS for 1998 – present. This task is now complete. 11 papers have been presented at this meeting.

The work is carried out by students at University of Western Ontario, London, Ontario, Canada. The working group needs nominal funding to support the students to continue the work. Rajiv requested funds for the grad students working on this task. A separate account is set up with no overhead at the University of Western Ontario. Cheques may be made payable to the University of Western Ontario.

Members are encouraged to review the paper lists to ensure completeness.

Annual Bibliographies will be made available on IEEE T&D website.

## 6 WEBSITE UPDATE

Brian Johnson requires information from the Working Group chairs regarding what should be published. If links to other websites or confidential sections are required, this is possible.

## **7 SUB-COMMITTEE GENERAL BUSINESS**

### **7.1 HVDC and FACTS Sub-Committee Website Update**

Brian Johnson provided a summary of the website activity. It was noted that the content needs to be updated. All information posted is provided in locked PDF format.

## **8 AWARD COMMITTEE UPDATES**

### **8.1 Uno Lamm Award**

The Uno Lamm award was not awarded this year. Nominations for this award are welcome. Dennis Woodford chairs the review committee, and Andrew Isaacs will determine whether he wishes to retain this position.

### **8.2 Nari Hingorani Award**

John Paserba received the 2011 Nari Hingorani FACTS award.

Nominations from the group are also needed for the Nari Hingorani award. Information on the award and nomination forms is available on the IEEE PES awards website.

## **9 HVDC PROJECTS LISTING**

Modifications to the the July 2010 version of the HVDC Projects Listing have been added to the listing. Any further modifications should be sent to Robyn. An email copy of the projects listing will be provided to members of the subcommittee.

The IEEE PES HVDC Projects Listing has been updated through:

- information received from members and guests of the HVDC & FACTS Subcommittee
- Press releases
- Internet searches
- Conference presentations

The HVDC Projects Listing includes two worksheets: one for existing projects and one for planned projects.

Robyn Page will coordinate with CIGRE to obtain their device listing, if possible.

## **10 SUBSTATIONS SUBCOMMITTEE**

Hubert Bilodeau presented the following summary of Subcommittee I0 activities. They have met in May 2011, and had a tutorial on VSC topics with the primary purpose to assemble the material for a T&D meeting and will send a report of that meeting.

Chair: Chris Horwill; [chris.horwill@areva-td.com](mailto:chris.horwill@areva-td.com)  
Vice Chair: Hubert Bilodeau; [bilodeau.hubert@hydro.qc.ca](mailto:bilodeau.hubert@hydro.qc.ca)  
Secretary: Dan Sullivan, [dan.sullivan@meppi.com](mailto:dan.sullivan@meppi.com)

They are working on two documents in I4. 15 people met at this meeting, to prepare a session for next summer. One of the goals is to review IEEE “electronic learning”.

Ongoing activities include reliability report from utilities (2003-2007). Some feedback has been obtained from industry, but further info is required.

Working group I5 is chaired by Ben Mehraban, and has similar activities to I4. At this time, some of the FACTS installations are in I4, and should be moved to I5. A report on availability and reliability will be added by this group. A tutorial is planned for next summer which is relating to new applications in wind power.

A new I5 task is a functional specification on STATCOM, based on the pattern set by the SVC. No PAR exists yet, but will be available at the Winter meeting.

I9 is a new group dedicated to protection of SVC equipment. This was the second session for the group, and was chaired by Mikhail Ilonen from Saudi Arabia. The first task is to obtain short circuit calculations from SVC.

I8 (PEBB) met at this meeting (Detroit). They have 2 task forces, one has published a standard on control and protection architecture for power electronics. The other task force (Ani Gole chair) is writing simulation tools for PEBB and PEBB-based systems.

## **11 LIAISON REPORTS**

No liaison reports were presented

## **12 PRESENTATIONS**

One presentation was provided during the July 2011 meeting:

1. “Tres Amigas and VSC Technology”, presented by Neil Kirby (Alstom Grid).

Copies of the presentations are provided on the Subcommittee website.

## **13 GENERAL REPORTS ON HVDC AND FACTS PROJECTS/DEVELOPMENTS**

The members and guests were provided with a forum to provide updates on HVDC and FACTS projects that they were presently working on.



**14 LOCATION OF THE NEXT MEETING**

The next IEEE PES HVDC & FACTS Subcommittee Meeting will be held at the IEEE PES General Meeting in San Diego on July 24<sup>th</sup>-29<sup>th</sup>, 2012.

**15 ADJOURNMENT**

The IEEE PES HVDC & FACTS Subcommittee Meeting Adjourned at 4:00 PM.

Minutes developed and respectfully submitted by Andrew Isaacs, Electranix Corporation.

**APPENDIX A**

**LIST OF ATTENDEES**

**Appendix A**  
**List of Attendees - 2011**

No.	Name	Affiliation	E-mail Address
1	Robyn Page	Teshmont	rpage@teshmont.com
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6	Lara Stregger	Teshmont	lstregger@teshmont.com
7	John Kappenman	Storm Analysis	jkappenma@aol.com
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12	Maryam Saeedifard	Purdue Univ.	maryam@purdue.edu
13	Nari Hingorani	Consultant	nghingorani@sbcglobal.net
14	Willie Wong	ABB Inc.	willie.wong@us.abb.com
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34	Ebrahim Rahimi	AESO	erahimi@ieee.org
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41	Jeremy Sneath	Electranix Corp.	js@electranix.com
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46	George Karady	Arizona State Univ.	karady@asu.edu
47	Aty Edris	Quanta Technology	aedris@quanta-technology.com
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