

IEEE HVDC AND FACTS SUBCOMMITTEE



<https://site.ieee.org/pes-hvdcfacts/>

MEETING MINUTES: 2021 IEEE PESGM

MEETING LOCATION AND TIME

Meeting date/time: Tue, July 27, 2021, 1:30 pm - 4:30 pm EDT

Location: on Webex

1. WELCOME AND ANNOUNCEMENTS: RAJIV VARMA

Chair Rajiv Varma opened the meeting by welcoming everyone.

2. INTRODUCTIONS

42 attendees. They introduced themselves.

3. APPROVAL OF 2021 MEETING AGENDA

Meeting agenda presented by Rajiv Varma; approved

4. APPROVAL OF MINUTES OF THE SUBCOMMITTEE MEETING DURING 2020 PESGM (AUG. 12, 2020)

Minutes of meeting presented by Rajiv Varma; Moved to accept by Wayne Litzenberger, seconded by Ben Mehraban: Minutes accepted

5. ELECTION OF SECRETARY

Dennis Woodford takes the floor and proposes Robyn Koropatnick, Principal, Stantec, Winnipeg, to serve as Secretary. No other nominations are received. Mojtaba Mohaddes seconds the nomination.

The nomination of Robyn Koropatnick as IEEE HVDC & FACTS subcommittee secretary is accepted.

6. TRIBUTE TO MICHAEL HENDERSON

Michael Henderson passed away in May. Condolences were offered by chair Rajiv Varma and past-chair Brian Johnson.

The floor was opened to everyone. Orestes Macchione takes the floor to share memories. Afterwards also Ben Mehraban and Joshua Burroughs.

The committee honors Michael Henderson with one minute of silence.

Brian Johnson informs the committee that also William (Bill) Long passed away on July 10. The committee honors William Long with one minute of silence

7. WORKING GROUP REPORTS

I. WG 15.05.02 DYNAMIC PERFORMANCE AND MODELING OF HVDC SYSTEMS AND POWER ELECTRONICS FOR TRANSMISSION SYSTEMS

- A meeting was held on 11 January 2021, a further meeting is on 3 August 2021
- Three panels are organized for IEEE PES General Meeting 2021
 - Off-line: Application of multi-scale modeling and simulation techniques to AC-DC power systems, Chair Yue Xia
 - On-line: Emerging Trends in Modelling and Control of HVDC and FACTS, Co-chairs Xiongfei Wang and Kai Strunz
 - On-line: Modelling and stability analysis of HVDC Transmission converters using analytical methods, Chair Dragan Jovcic
- 2 TFs started work in 2020
 - TF on Multi-scale Modeling and Simulations of HVDC and FACTS
 - TF on Frequency-domain modeling and dynamic analysis of HVDC and FACTS
- Good progress was made on a paper on a test system for model validation, performance analysis, and controller design for FACTS. The dataset was elaborated, pictures improved, and a European context added

II. WG 15.05.08 HVDC ECONOMICS AND OPERATING STRATEGIES

Notes on 2021 WG / Panel Presentation: July 26th, 2021:

- 1) Following various calls with WG officers and individual panelists we decided there would be little value having an online WG meeting.
- 2) We clarified that this year's panel session will be pre-recorded with no possibility for live questions.
- 3) The GM21 panel session was successful and included the following presentations:
 - Dan Kell (HATCH): Transmission Projects Development.
 - Andrew Bailey (Mitsubishi Electric): FACTS Assets Management.
 - Neil Kirby (GE): Offshore Wind HVDC Systems
 - Sergey Kynev (Siemens Energy): The role of FACTS in Offshore Renewables Integration.
 - Orestes Macchione (Siemens Energy): HVDC Recent Developments & Future Trends. A manufacturer's view
- 4) Discussion on inviting panelists for the panel session in GM21: the officers will request early abstracts from interested panelists.
- 5) For GM22, the officers request a meeting time of 11AM-12:30PM on Monday for the WG and a Panel session on Monday from 1:00-5:00 pm with about 8 speakers. Presentation will try to take a practical approach to project development to support the implementation of FACTS and HVDC projects in the electrical grids. Following the presentations, we will try a Q&A session -with questions compiled partly in advance of the call.
- 6) WG Chair Orestes Macchione proposed to continue in role. We would confirm remaining officers during August 2021.
- 7) Looking forward to the GM22 in-person meeting.

III. WG 15.05.14 EDUCATION ON HVDC AND FACTS

- The working group hasn't met. We will start out trying to set things up by e-mail, and will have a Zoom meeting if needed.
- We are planning to propose several panels.
 - a. T&D conference: Introduction to HVDC and FACTS (2 hour)

- b. T&D conference: Enhancing grid resilience with HVDC and FACTS (2 hour)
- c. PESGM: Enhancing grid resilience with HVDC and FACTS
 - Somewhat different focus from the T&D panel, with some different speakers.

IV. WG 15.05.18 STUDIES FOR PLANNING OF HVDC AND WG 15.05.19 PRACTICAL TECHNOLOGIES FOR VSC HVDC SYSTEMS

Joint report of the two WG:

Activities:

- Joint WG meeting on 23rd July 2021.
- Panels 2021
 - Grid forming capability for HVDC: definitions and applications , Tuesday 27/7, 6:00 AM - 8:00 AM, Session Chair 1: Jef Beerten KU Leuven
 - Impact of COVID 19 on HVDC operations, Thursday, 29/7, 8:00 AM – 10:00 AM, Session Chair 1: Abhay Kumar Hitachi ABB Power Grids
 - Using replica converter models for HVDC system simulations (Two parts), Thursday, 29/7, 8:00 AM – 12:00 AM, Session Chair 1: Dirk Van Hertem KU Leuven
- Published PES TR-86 Studies for Planning HVDC in February 2021

Future Plans and Activities:

- Next WG meeting around February 2022
- Further work on panel topics
 - Definition of Grid forming: to be discussed at PES level!
 - Webinar on PES TR-86 Studies for Planning HVDC
- Future topics/Panel/ Supersession
 - Supergrid & offshore wind with HVDC grids
 - Policy maker to bridge the society need to local implementations
 - HVDC as a socially acceptable solution to transmission system investments
 - Technical aspects of HVDC: LCC/VSC, meshing at AC and DC side
 - Large scale energy transmission using HVDC or Hydrogen
 - Harnessing the advantages of advanced HVDC networks
- We would like to submit our tutorial proposal on basics of VSC HVDC again for the 2022 edition

V. P2745– UNIFIED POWER FLOW CONTROLLER WORKING GROUP

Aug. 26 - Aug. 29, 2020, Web WG meeting

- 8 entity members
- 22 attendees (1 online attendee)
- Approval of agenda for the 7th WG meeting and the minutes of the 6th WG meeting
- Technical discussion
 - The draft and comments for P2745.2/D3 were discussed.
 - The outline of P2745.4 was discussed by the attended WG members, and a consensus on the following clauses was reached including adding Clause 5 General configuration requirements, and modifying Clause 10 Test of UPFC control and protection system.
 - The draft and comments for P2745.4/D1 were discussed till Subclause 7.1.3, and remainder parts of P2745.4/D1 will be discussed in the 8th WG meeting.

- Approval on submission of P2745.2/D4 for sponsor ballot
- IEEE Std P2745.3-2020 Approval and Publication
 - IEEE P2745.3-2020: Guide for Technology of Unified Power Flow Controller Using Modular Multilevel converter: Part 3. Thyristor Bypass Switch (published Dec 2020)
- IEEE P2745.2 Approval
 - P2745.2/Draft 5 IEEE Draft Guide for Technology of Unified Power Flow Controller Using Modular Multilevel Converter: Part 2 Terminology (Approved June 2021)

Next Plan

- Preparation for the 8th WG meeting (Aug. 28-31, 2021, Delayed)
 - Discussions on the current draft and comments for P2745.4
- Publication of IEEE P2745.2 in 2021

8. REPORT ON 2021 PANEL SESSIONS

7 panel sessions, all submitted proposals were accepted.

- 1) Modelling and stability analysis of HVDC Transmission converters using analytical methods: Dragan Jovcic and Xiongfei Wang
- 2) Application of multi-scale modeling and simulation techniques to AC-DC power systems: Shahin Filizadeh and Yue Xia
- 3) Using replica converter models for HVDC system simulations: Dirk Van Hertem
- 4) Impact of COVID 19 on HVDC operations: Abhay Kumar
- 5) Grid forming capability for HVDC: definitions and applications: Jef Beerten
- 6) Recent HVDC and FACTS installations, refurbishments, and special techno-economic choices: Orestes Macchione
- 7) Emerging Trends in Modelling and Control of HVDC and FACTS: Xiongfei Wang and Kai Strunz

9. PLANS FOR PANEL SESSIONS AND TUTORIALS FOR 2022 PES CONFERENCES

- i) Call for papers:
 - https://www.ieee-pes.org/images/files/pdf/pesgm2022/2022_GM_Call_for_Papers_Flyer-Final.pdf
 - Nov. 10, 2021: Deadline for Paper submission
- ii) Panel Sessions
 - INTERNAL Deadline August 8, 2021
 - October 27, 2021: Internal deadline for proposing panel sessions
- iii) Tutorials
 - Deadline: Aug. 6, 2021
 - <https://www.ieee-pes.org/ieee-pes-2022-call-for-tutorials>
- iv) Supersessions
 - Interest was expressed from Subcommittee members to contribute to supersessions. This information will be conveyed to the T&D Committee.

10. AWARD COMMITTEE UPDATES

- i) Uno Lamm Award Committee (Abhay Kumar)
 - Received by **Hans Bjorklund** for outstanding contributions and visionary leadership to the development of advanced control and protection systems for HVDC

- ii) Nari Hingorani Award Committee (Ram Adapa)
 - a. Custom Power Award
Received by **Ambrish Chandra** for contributing in improvement of power quality and grid integration of renewable energy sources
 - b. FACTS Award
Received by **Rajiv Varma** for advancing FACTS controllers application in education, research, and professional society, and for developing an innovative STATCOM technology utilizing PV solar farms
- iii) New Fellows from Subcommittee (Rajiv Varma)
More nominations are sought for: Subcommittee can support if needed
- iv) Nominations from subcommittee for PES Awards
 - IEEE PES Prize paper
 - PES Working group recognition award
 - Technical Council Young Professionals Award
 - Technical Council Distinguished Service AwardDescriptions of each of the awards will be circulated

11. REPORT OF IEEE SUBSTATIONS COMMITTEE

Status update on the working groups and standard in IO right now

WGI1 – IEEE C37.431.40 – PAR has been submitted to combined IEEE 1585 and 1623.

WGI2 – IEEE 1534 – PAR expires December 2022. Will attempt to ballot this year.

WGI3 – Effort to combine IEEE 1031 and 1052. IEEE PC37.431.10. PAR not written. Commence 2023.

WGI4 – IEEE 1031 will be allowed to go dormant. IEEE 1303 will be combined and updated with STATCOM information. Commence 2024.

WGI5 – IEEE 1052. 2018. Will be allowed to go dormant.

WGI6 – Not used

WGI7 – IEEE P1240 in progress. PAR expires 31 DEC 2023. Expected to go to ballot in early 2023.

WGI8 – IEEE 1676 dormant

WGI9 – IEEE PC37.140.20 – in progress. 31 Dec 2023

WGI10 – IEEE 1378 in ballot. PAR expires 31DEC 2022. IEEE 1626 need PAR extension, expired 31DEC2021.

WGI11 – IEEE PC37.430.10. Need to get update from Andrew Steffen.

IO is sponsoring the entity-PAR IEEE P2825. A kick-off meeting was held in June of 2022.

New incoming IO Chair January 2023 – David Langner. Jan Paramalingam will become the secretary.

12. LIAISON REPORTS

i) CIGRE B4 (Dirk Van Hertem)

Dirk Van Hertem shared the report prepared by Cigré B4 on ongoing activities (new Working groups and recently finished working groups)

ii) CIGRE US National Committee (Ben Mehraban)

Ben Mehraban informed about the status of the Cigré committee, in particular he mentioned the Centennial meeting held this year (virtual)

13. OLD BUSINESS

i) Subcommittee Endorsements for IEEE Fellow nominations

ii) Subcommittee Website Updates (<https://site.ieee.org/pes-hvdcfacts/>)

14. NEW BUSINESS

i) Proposal for initiating new activity on “100% Renewable Energy Systems Enabled by HVDC” – Dirk Van Hertem

- Also consider batteries and their influence on such system
- Grid forming capability is important
- Dynamics group is interested to contribute
- Proposal is to start with a panel/supersession for 2022, initiative with Dirk

ii) Interest from IEEE Transformers Subcommittee for collaboration with HVDC and FACTS Subcommittee – Rajiv Varma

iii) Brief update on IEEE standard P2800 by Wes Baker (2nd round now, published early next year)

15. PRESENTATIONS

i) US Offshore Wind Grid Connections, by Kevin Pearce from Siemens Energy

ii) HVDC developments in Europe, by Cornelis Plet from DNV

16. GENERAL REPORTS ON HVDC AND FACTS PROJECTS/DEVELOPMENTS

Dirk Van Hertem: EU commission has initiated a HVDC working group on the SET plan to develop an implementation plan for HVDC grid development

Frank Kreikebaum: 600 MVar of SSSC installed in 7 projects in the last year

17. NEXT HVDC AND FACTS SUBCOMMITTEE MEETING

2022 IEEE PES GM, Denver, CO, USA.

Wednesday, July 20, 2021, 1:30 pm – 4:30 pm MDT

18. Adjourn

Meeting ended 4:30 pm.

Prepared and respectfully submitted by,

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and

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