Online Workshop

Harmonization of HVDC systems
Best practices and potential for standardization

Part 1
HVDC switchgear and protection systems
Time: Wednesday | 17 June 2020 | 10:00–13:00
Location: Microsoft Teams Meeting

Part 2
HVDC systems control and grid codes
Time: Friday | 19 June 2020 | 10:00–13:00
Location: Microsoft Teams Meeting
PROMOTioN – Project Facts, Objectives & Partners

Project facts

33 partners

11 countries

4.5 years

(2016 – 2020)

Total budget

€ 42 million
PROMOTioN – Project Facts, Objectives & Partners

**Demonstrators**

**HVDC network control**
- MMC test bench
- RWTH Aachen
  - Aachen, Germany

**HVDC network protection**
- Multi-terminal test centre
- SSE Transmission
  - Glasgow, UK

**HVDC circuit breakers**
- KEMA High Power Lab
  - Arnhem, Netherlands

**HVDC gas insulated system**
- KEMA High Voltage Lab
  - Arnhem, Netherlands
  - Lead: ABB

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This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 691714.
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WP1 – Requirements for meshed offshore grids - TenneT

WP2 - Grid topology & Converters
RWTH Aachen

WP3 - WTG - Converter interaction
DTU

WP4 - HVDC Grid Protection Systems
KU Leuven

WP5 - Test environment for HVDC CB
DNV GL

WP6 - HVDC CB performance characterisation
UniAberdeen

WP7 - HVDC GIS Demonstrator
ABB

WP8 - Regulation & Financing
TenneT

WP11 – Harmonisation towards standardisation - DTU

WP12 - Deployment plan for future European offshore grid - TenneT
Workshop Harmonization of HVDC systems
Part 1: HVDC switchgear and protection systems

WP1 - Requirements for Meshed Offshore Grids • TenneT
WP2 - Grid Topology & Converters • RWTH Aachen
WP3 - WTG – Converter Interaction • DTU
WP4 - HVDC Grid Protection Systems • KU Leuven
WP5 - Test Environment for HVDC CB • DNV GL
WP6 - HVDC CB Performance Characterisation • UniAberdeen
WP7 - HVDC GIS Demonstrator • ABB
WP8 - Regulation & Financing • TenneT
WP9 - Protection System Demonstration • SHE Transmission
WP10 - HVDC Circuit Breaker Demonstration • DNV GL
WP11 - Harmonisation Towards Standardisation • DTU
WP12 - Deployment Plan for Future European Offshore Grid • TenneT
WP13 - Dissemination • SOW
WP14 - Project Management • DNV GL
WP15 - Test Environment for HVDC CB • DNV GL
WP16 - MMC Test Bench Demonstrator • RWTH Aachen

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Workshop Harmonization of HVDC systems

Part 2: HVDC systems control and grid codes

WP1 - Requirements for Meshed Offshore Grids - TenneT

WP2 - Grid Topology & Converters - RWTH Aachen

WP3 - WTG – Converter Interaction - DTU

WP4 - HVDC Grid Protection Systems - KU Leuven

WP5 - Test Environment for HVDC CB - DNV GL

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WP16 - MMC Test Bench Demonstrator - RWTH Aachen

WP9 - Protection System Demonstration - SHE Transmission - DNV GL

WP10 - HVDC Circuit Breaker Demonstration - DNV GL

WP13 - Dissemination - SOW

WP14 - Project Management - DNV GL

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## Workshop Harmonization of HVDC systems

### Part 1: HVDC switchgear and protection systems

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<td>17 June 2020</td>
<td>Introduction to the workshop&lt;br&gt;Poul Sørensen, DTU</td>
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<td>10:00 – 10:15</td>
<td>HVDC Protection Systems - Towards Harmonisation&lt;br&gt;Geraint Chaffey, KU Leuven</td>
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<td>10:15 – 10:30</td>
<td>Development of circuit breaker standards&lt;br&gt;Rene Smeets, KEMA</td>
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<td>10:30 – 10:45</td>
<td>Harmonization of GIS&lt;br&gt;Uwe Riechert, ABB and Hong He, Kema</td>
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<td>10:45 – 11:00</td>
<td>Cable systems for HVDC power transmission&lt;br&gt;Hong He, Kema</td>
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<td>HVDC Standardisation Activities of TC17/SC17A/SC17C&lt;br&gt;Mark Waldron, National Grid</td>
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<td>Landscape of HVDC Grids Standardization in IEC&lt;br&gt;Kyoichi Uehara, Toshiba</td>
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<td>Discussion&lt;br&gt;Moderator: Poul Sørensen, DTU</td>
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Discussion – HVDC switchgear and protection systems

• Discussion points - under the heading HVDC switchgear and protection systems:
  • Additional questions and discussions to presentations
  • Future R&D needs to support standardization of HVDC switchgear and protection systems
  • Need to propose new standardization work for HVDC switchgear and protection systems?
  • Any other issues regarding standardization of HVDC switchgear and protection systems

• How to participate in discussion:
  • 6 presenters are free to take the word
  • Other participants, please write in chat
APPENDIX

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