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Inter OPERA
Enabling multi-vendor HVDC grids

NEWSLETTER
September 2024

Co-funded by the European Commission's Horizon Europe programme, "Enabling interoperability of multi-vendor high-voltage direct current (HVDC) grids" (InterOPERA) brings 21 European partners together to unlock the potential of HVDC grids and to enable the large-scale transition of the European energy sector.

3rd General Assembly

On 17 - 20 June InterOPERA partners met in Oslo for the 3rd General Assembly. The meeting was sponsored by Statnett SF and Equinor.

At the assembly, project partners looked back at the first 18 months of InterOPERA, closing the first stage of the project – defining the functional specifications for

interoperable offshore wind grids. The project is now moving into the second stage: designing a real-time physical demonstrator.

Hakon Borgen, Executive Vice President Offshore Development at Statnett SF, gave a keynote speech to the General Assembly and stressed the importance of HVDC technology for the future expansion of offshore wind. Without HVDC there will be no meshed interconnected offshore grid.

INTEROPERA PARTICIPATION AT EVENTS

IET ACDC Europe 2024

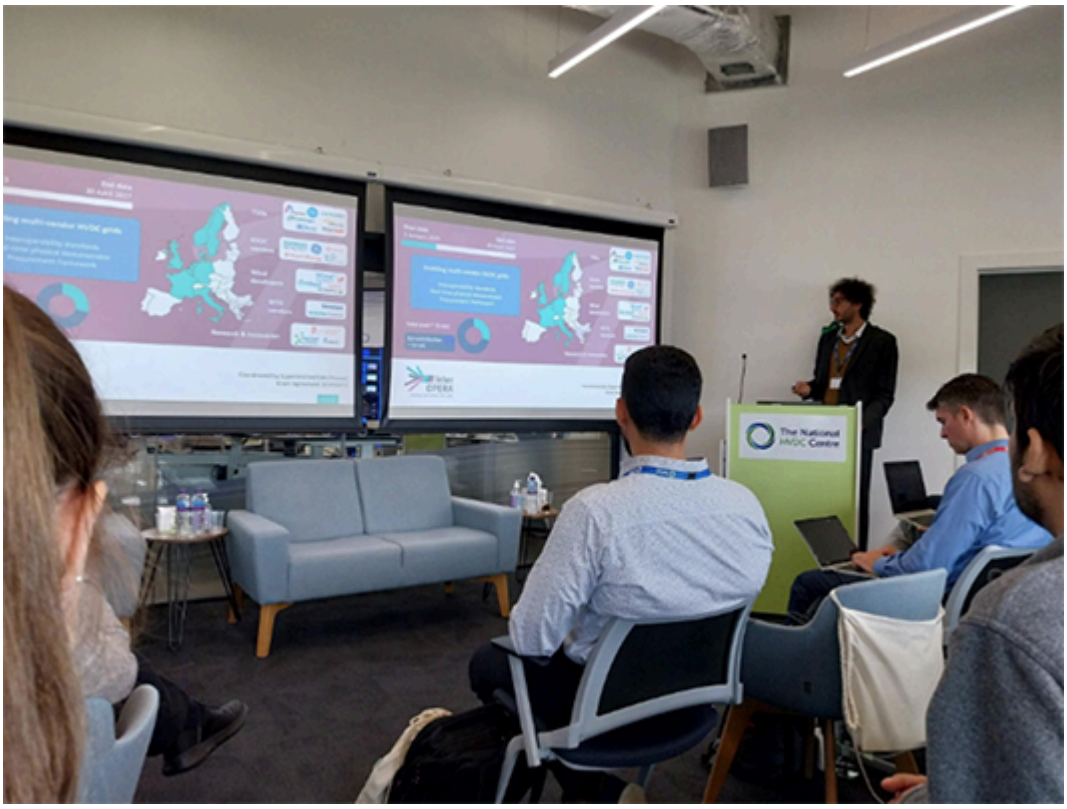
On 14 May 2024 InterOPERA attended the Institution of Engineering and Technology (IET) ACDC Conference in Amsterdam. On the first day, coordinators for projects relating to the deployment of DC technology in Europe gave presentations. The InterOPERA coordinator, SuperGrid Institute, gave an overview of the project. They also looked at the progress made on the legal aspects of the cooperation agreements needed to deliver multivendor projects.

The general theme of all project presentations was the importance of interoperability, grid-forming capabilities in distributed generation grids, and of de-risking HVDC projects. Projects also noted a strong economic push towards standardisation, driven by the rising costs of equipment. All presentations stressed the importance of a successful InterOPERA project.

This first workshop looked at the upcoming reports of Work Package 1 (development of standardised interaction study processes and interfaces) and on the recently published report “Demonstrator Definition & System Design Studies” prepared by the Work Package 3 experts. You can download the report here.

Check out here the full list of the Stakeholder Committee members.

Annual HVDC Operators' Forum



On 12 – 13 June 2024, InterOPERA attended the Annual HVDC Operator's Forum at the National HVDC Centre in Glasgow. The event brings together a large technical audience of transmission system operators, equipment manufacturers, and experts involved in HVDC projects. It is a key outlet for experts to share insight on the development and operation of HVDC systems linked to the Great Britain network.

The InterOPERA coordinator, SuperGrid Institute, gave a roundup of the most recent InterOPERA updates during a session focusing on HVDC developments outside of Great Britain.

Updates from Work Packages

Work Package 1 "Development of standardised interaction study processes and interfaces"

Working Package 1 has finalised work on the requirements for models and replicas to be delivered by vendors. A report on this topic will be published soon. System owners will use it as a reference in future calls for tender./p>

During the second quarter, Working Package 1 has also been finalising work on the fundamental requirements for simulation platforms, focusing on essential features for Electromagnetic Transient (EMT) simulation tools, both in offline and real-time scenarios.

Moreover, Work Package 1 experts continue to work on a report on the interaction studies process, now focusing on small signal stability studies, large disturbance studies, and AC and DC protection tests. Through pragmatic guidelines, the aims of the studies are to ensure that the entire system is robust and can be operated safely. The report also addresses the multi-iteration process, which is a challenging topic when multiple vendors

are involved. Multiple versions of the control and protection systems are expected to be tested during the project's timeline.

At the end of June, RTE and TU Delft experts successfully carried out the official Factory System Test (FST) and hands-on training for the two Siemens Energy Converter Station Control and Protection (C&P) replicas at the Siemens Energy HVDC Testing Center in Forchheim, Germany. The successful Factory Tests mark the start of the dry run. So what comes next? Siemens Energy is now getting equipment ready to install the other converter station at TU Delft in the Netherlands. The subsequent phase will involve additional vendors delivering their C&P replicas.

Work Package 2 "Requirements and assessment of interoperability for multi-vendor multi-terminal HVDC systems"

Work Package 2 published the report "Functional requirements for HVDC grid systems and subsystems". With it, InterOPERA stakeholders have laid out a consolidated framework for industry partners and a set of non-exhaustive functional requirements to ensure multi-vendor interoperability by design. The functional framework is important to limit the risk of interoperability issues between different vendors, by specifying basic operational rules for control and protection.

The report is available here.

Work Package 2 experts will continue to work on the report and an updated version will be ready by the end of 2024. This will include studies with recommendations on selecting specific functions and their parameters range, where applicable.

At the same time, Work Package 2 experts are working on the multi-vendor HVDC grid system integration tests. Preparations are underway to develop the test protocols and procedures needed to test the multi-vendor demonstrator in real time and offline, and frequency domain simulations.

Work Package 3 "Multi-vendor multi-terminal demonstrator project"

Work Package 3 experts are currently working on the HVDC grid subsystems pre-design – and more specifically on defining use cases and functionalities that the demonstrator must test.

During the summer they will begin drafting the functional specifications for coordinated DC grid control, DC switching stations, and DC protections.

Work Package 3 organised two hybrid workshops at the WindEurope office, focusing on the demonstrator project.

The goal of the first workshop was to plan out the work to draft the functional specifications for the demonstrator project. These specifications will cover all necessary aspects needed to bring a multi-vendor, multi-terminal HVDC project to life. Work Package 3 experts also spelt out criteria to align the results of the exercise with the demonstrator's use cases.

The objective of the second workshop, was to align the demonstrator use cases and features. A third workshop targeting the TSO community will continue this work.

Work Package 4 “Cooperation framework and governance”

By the end of 2024, Work Package 4 will update the Generalised Multi-Party Cooperation Framework. The first version of this was published last December (available here). This document aims to guide future multi-vendor, multi-terminal HVDC projects by clearly defining the roles, duties, and responsibilities of all relevant parties.

In the updated version the focus will be on supporting InterOPERA by addressing ongoing cooperation and governance issues and incorporating insights from the InterOPERA initiative. Statnett and Ørsted are leading the development of the cooperation framework, with the University of Groningen serving as the main legal expert.

To update the cooperation framework document Work Package 4 experts carried out stakeholder interviews in March and April with key InterOPERA participants – including HVDC vendors, TSOs, labs, and wind farm stakeholders. These interviews gave valuable perspectives on the legal and practical challenges the framework aims to address.

Work Package 4 created two task forces. One will look at intellectual property risks for the project and finalise the mitigation action plan for them, which will be handled proactively by a dedicated team between now and the end of the year. The other task force will develop a governance structure for model and data-sharing within the project. This one is working hard to deliver key results by the end of summer 2024.

All of these activities made significant progress during two working sessions dealing with procurement topics. These were held in collaboration with Work Package 5. The first workshop was hosted in April by Elia Group (50Hertz) in Berlin and lasted 3 days (see more below under updates to Work Package 5). The second session was hosted by Statnett in Oslo in June, just after the General Assembly.

In June, Work Package 4 finalised an internal report – “Competition Law Review: Analysis of the Potential Effect upon InterOPERA of the European Commission's New Horizontal Block Exemption Regulations and Horizontal Guidelines to the EU Repository”. In the context of the InterOPERA project, this report looks at the potential effect of the European Commission’s New Horizontal Block Exemption Regulations and the Commission’s revised Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-operation Agreements.

Work Package 5 “Procurement Strategy and Future Projects Preparation”

From 15 – 17 April, Work Packages 4 and 5 held a joint workshop at the 50Hertz offices in Berlin. This three-day event brought 35 representatives together from all relevant disciplines – lawyers, project managers, procurement specialists, and HVDC commissioning experts.

The workshop focused on defining processes, roles, and responsibilities for the first multi-vendor, multi-terminal projects. Participants worked on dividing HVDC Grids into

procurement lots and identifying interfaces between the two Work Packages. This collaboration helps to ensure that the multi-party cooperation framework of Work Package 4 seamlessly integrates with the procurement and contract preparation efforts of Work Package 5.

Additionally, Work Package 5 experts have made major progress in defining the main electrical components needed for procurement processes. They have developed a reference scenario to capture challenges related to interfaces, ownership, and procurement sequence. The next steps include developing procurement options.

Work Package 5 has also launched a new workstream, focused on creating the legal and contractual preparations to ensure compliance, risk management, and sound collaboration between stakeholders within multi-vendor HVDC systems.

Get in touch with us:

Do you want to learn more about InterOPERA or have questions on our work?
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