



Welcome to the Spring edition of our newsletter; during an unusual time for all of us as our countries lock-down. However, with many people working from home, our Webinar series is proving very popular and there are a number of exciting development across the industry which continue to progress; described in this Newsletter. We have decided to postpone our HVDC Operators' Forum (planned for 24-25 June); we plan to run some virtual sessions on these dates, and hope to reschedule the event later in the year.

Upcoming Webinars

Friday, 24 April (3.15pm – 4:30pm UK Time)

Webinar: Practical Use of Real Time Simulation for De-risking HVDC Integration (a repeat of the 16 April event). Hosted by the HVDC Centre and RTDS Technologies. [Click Here to Register.](#)

Wednesday, 13 May (12:30-13:30 UK Time)

Webinar: Demonstration of DC Grid Protection – PROMOTioN WP9 Results so Far. Hosted by the HVDC Centre and PROMOTioN WP9 Partners. [Click Here to Register.](#)

Integrated Offshore Design

Earlier this month, we delivered a summary of our findings on the design of integrated offshore connections to the Offshore Wind Industry Council (OWIC).

Building on established technologies, we developed a toolkit of flexible integrated solutions for the connection of offshore Wind, at the scales required within the future offshore development zones.

Incorporating innovative Bi-pole based solutions, these designs minimise the extent of offshore infrastructure, providing consent and cost benefit; and have been considered against current industry technical codes and standards, and provide the ESO and TOs with options for providing increased boundary capacity to the onshore network.

These solutions, will feed into an integrated activity over the summer to identify the best path across design, process and future codes and standards.

The Centre will be issuing a report to the group at the end of April, and looks forward to supporting the next stages of this activity.

Oluwole Adeuyi & Ben Marshall

Grid Code Modifications for a Converter Dominated System

In March 2020, National Grid ESO raised a modification proposal GC0141: Compliance and Modelling Processes, approved to go forward at the 26th March Grid Code Panel meeting, at which this modification was given the highest priority to proceed, being directly related to Ofgem's recommendations following the 9th August 2019 low frequency event.

Combined with two other modifications: GC0138 defining new process options for demonstrating compliance and GC0137 defining new control system performance and implementation for system stability, this trilogy of related code modifications perhaps form the most significant changes in the Grid Codes history surrounding how we manage a future mode complex system.

The Centre has been active in this space for some time and attended the first of the Workgroup meetings on 9th April 2020. The Centre has pioneered a range of techniques across RTDS-HiL supporting a range of testing (including protection), Replica use, cross simulation platform validation, and composite system testing philosophies, and will continue to support these changes and provide the industry with the analysis tools and techniques it needs.

Ben Marshall




To find our more, please contact us to discuss or to arrange a visit:

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2020 Innovation Programme

The 2020 HVDC Call for Research Proposals attracted 18 full proposals from 12 institutions/consortiums, all of which were strong, relevant and of high-quality.

Of these 18 proposals, the Centre's Technical Advisory Board selected 3 projects for funding by the HVDC Centre; which are currently being kicked-off:

- Protection Performance Overview and Validation in Low Strength Areas (with Manitoba Hydro International); 
- Adaptive Damping of Power Oscillations using HVDC (with EPRI); and 
- Evaluation of HVDC with Synchronous Condenser impact on AC Protection (with the University of Strathclyde). 

Executive summaries of these 3 projects are available at: www.hvdccentre.com/innovation/

Oluwole Daniel Adeuyi

DPSP Conference 2020

Simulation Engineers, Ian Cowan and Bharath Ponnalagan, attended in the 15th International Conference, hosted by the IET, on Developments in Power System Protection (DPSP) this month.

The event was well organised and very useful, with many interesting and innovative papers presented, along with the opportunity to talk to lots of key connections from across the network and various organisations; including Transmission Operators, Manufacturers (e.g. ABB, Siemens, GE, etc), Consultants and Universities.



The conference papers we presented/supported at the Conference were:

- *Demonstration of Partially Selective HVDC Grid Protection System with Hardware-in-the-loop IEDs;*
- *Coordination of ac protection settings during energisation of ac grid from a VSC-HVDC interconnector; and*
- *Multi-vendor interoperability tests of IEDs for HVDC grid Protection.*

Bharath Ponnalagan & Ian Cowan

Converter Analysis: An Emerging Consensus

On 19 February we presented at 'ACDC Protection Essentials of the Future', held at the Technology University of Delft, Netherlands.



This conference was attended by a range of TSOs, academics, consultants, developers and manufacturers (Siemens and GE), and focussed on the challenges of both AC and DC protection.

The HVDC Centre's presentation covered the output of recent PROMOTioN activity on DC protection relay testing, and on the broader challenges associated with protection design and testing for a converter dominated environment.

Key takeaways from the event were that all TSOs share a common range of concerns in this area and are beginning to specify new requirements on converters and data exchange to support protection testing. Academics and consultants are increasingly recommending the use of Real time simulation to support protection investigations, and manufacturers are developing new approaches to managing the integration of their protections on a weaker system.

Ben Marshall

Webinar Events

Our 2020 HVDC webinar series is intended to facilitate exchange knowledge on a variety of topics.

- The first webinar was held on 13 February, titled 'HVDC energisation and Impact of AC Protection' and was co-hosted with EPRI;



- Our second webinar, on 27 February, was co-hosted with the University of Strathclyde (pictured above) and focused on 'Stability Assessment and Mitigation of Converter Interactions';
- On 20 March, we discussed 'HVDC Challenges in meeting GB Grid Code', co-hosted with Cardiff University; and
- Co-hosted with RTDS Technologies, on 16 April, we held a webinar on the 'Practical Use of Real Time Simulation for De-risking HVDC Integration.

These webinars have proved very popular, attracting over 100 participants at each.

A summary of slides presented and insights gathered from the webinars is available at: www.hvdccentre.com/news/

Details of upcoming webinars and registration guidelines are available at: www.hvdccentre.com/events/

Md Habibur Rahman

To find out more, please contact us to discuss or to arrange a visit:

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