



Welcome to our spring edition of the HVDC Centre newsletter, where we announce our new research grant scheme, update on EU innovation, feedback from our recent replica training, share development on DC breaker simulation, share our experience of attending the SIF Community Forum, and thank the PNDC for hosting us at a recent visit.

Above is a photograph from a training course held on 23 April 2026

Simon Marshall

The National HVDC Centre Flexible Research Grant Scheme 2026: Enabling Targeted Innovation in HVDC

The National HVDC Centre has launched its 'Flexible Research Grant Scheme' which supports one-year, high-impact academic research addressing priority technical, operational, and commercial challenges associated with HVDC deployment in Great Britain.

The scheme provides a flexible, problem-led route for collaboration between universities and industry, focusing on clearly defined research questions of direct relevance to GB transmission owners and the system operator. Projects are typically exploratory in nature, and aimed at advancing capability, improving modelling and system understanding, and reducing delivery risk in HVDC systems.

Following a consultation session on 4 March 2026, attended by academic partners and representatives of GB transmission owners and the system operator, the scope of research was published. This covers priority themes including wide-area AC/DC control architectures, solving frequency-domain specifications to de-risk control interactions, converter specification for large-signal stability of HVDC grids, HVDC cable modelling, and technology-agnostic approaches to AC

grid integration. Full details of the call, including eligibility and submission requirements, are at: www.hvdccentre.com/academic-engagement/flexible-research-grant-call-2026/.

Proposals are assessed against the published criteria, with funding decisions prioritising relevance, feasibility and confidence of progression towards practical impact.

Detailed descriptions of the current priority areas are set out here: www.hvdccentre.com/wp-content/uploads/2026/03/Topics-of-Flexible-Research-Grant-2026.pdf

Further context and guidance for prospective applicants were provided during the April 2026 webinar, with materials accessible via the call webpage.

Through the Flexible Research Grant Scheme, The National HVDC Centre aims to stimulate focused academic-industry collaboration, strengthen the technical evidence base for future HVDC deployment, and accelerate innovation critical to a resilient, low-carbon electricity system.

Dong Chen

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New Research, Development and Innovation Initiatives for HVDC in the EU

For the past 18 months The National HVDC Centre has been supporting other European TSOs, OEMs, research institutions and Government within the EU HVDC SET plan to support the delivery of an R&D strategy and implementation plan across electricity over the next 5 years:



[ENTSO-E RDI Implementation Plan 2026–2030](#)

Of the 13 objectives, 4 specifically relate to HVDC innovation project delivery, which will build upon existing HVDC research activities from 2027 onwards within EU Horizon calls.

ENTSO-e and EU have been highly receptive to these inputs, recognising the increasing importance of HVDC technology in supporting the energy transition, the need to support supply chain capability, the need to support the delivery of meshed DC grids, and optimise their expandability, interoperability, resilience and functions (for example in the delivery of DC circuit breakers and grid forming solutions integrating separate energy storage devices).



The HVDC Centre continues to actively progress work across these areas. This includes recently commencing work on two new UK Strategic Innovation Fund projects, HVDC Wind Connect and SPRINT, which allow the Centre to continue to take a lead on the UK and EU direction of HVDC technology development and capability.

The Centre has further contributed to two distinct and potentially significant research proposals in relation to EU Horizon call 2026 CL5- 2026-03 – D3.19 “Affordable and sustainable primary equipment for Future – Ready multi-terminal HVDC systems” which we will hope to update you further about in a future newsletter.

Ben Marshall

Real-Time Simulation & CMS Replica Training

The Centre recently delivered two ‘Introduction to Real-Time Simulation and the CMS Replica’ training sessions. The full one-day course, delivered by Shangen Tian with support from Arpan Jana, was attended by SSEN Transmission System Planning and System Performance engineers. A reduced version was delivered for NESO Control Room engineers, with support from the SSEN Transmission Control Room.



The sessions provided a practical introduction to real-time simulation and hands-on experience with the Caithness–Moray–Shetland (CMS) HVDC Replica, highlighting how replica-based studies support safe operation, commissioning, and power system learning. Attendees explored the fundamentals of real-time simulation, before moving into the CMS Replica Room for live demonstrations and interactive exercises.

The training covered:

- An overview of real-time simulation and its role in HVDC studies;
- The CMS HVDC link architecture and operating modes;
- Live demonstrations of start-up, shut-down and operational workflows;
- Role-play, hands-on sessions operating the replica as CMS control engineers; and
- Operational and protection scenarios, including learning from real system events.

Participants highlighted the value of seeing live operational scenarios, engaging directly with the hardware, and experimenting with the replica model to simulate different sequences. The balanced mix of presentations, demonstrations, and practical sessions was praised for being engaging and effective. Feedback confirmed the training met and, in some cases, exceeded expectations, improving understanding of HVDC system operation, control sequences, and the practical benefits of replica-based testing. Several attendees expressed interest in follow-on sessions on RSCAD modelling and deeper interaction with the simulation environment.

Overall, the course demonstrated how real-time simulation and the CMS Replica provide a safe, controlled environment to build operational confidence, validate scenarios, and support ongoing system performance and planning activities.

Arpan Jana

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Advancing DC Circuit Breaker Technologies Through Real Time Hardware in Loop Simulations

In March 2026, The National HVDC Centre successfully conducted real-time Hardware-in-the-Loop (HIL) simulation testing of advanced functionalities of a DC Circuit Breaker (DCCB) model implemented on an FPGA-based platform, delivered in collaboration with the University of Edinburgh.

This activity was undertaken as a proof of concept within the Network DC project and represents an important step towards validating next-generation approaches for real-time modelling of fast-acting DC protection technologies.



The testing used real-time simulation to assess and demonstrate advanced control and protection functionalities of a DCCB model, while more broadly showcasing the potential of FPGA-based real-time modelling approaches for representing the fast time-scale phenomena in HVDC systems. This work helps build confidence in the use of FPGA platforms as a flexible foundation for modelling and testing a wide range of power system components with quick response time in a controlled HIL environment.

The activity also strengthened collaboration between academia and industry, showcasing how joint research can accelerate innovation in HVDC systems.

Building on the outcomes of this proof of concept, further development and expanded research into advanced DCCB functionalities will be carried out as part of the FAST DC project in collaboration with the University of Edinburgh, supporting the continued advancement of resilient and flexible HVDC networks.

Arpan Jana

SIF Community Forum 2026

On 3 March 2026, Arpan Jana and Gowtham Tammana represented The National HVDC Centre at the Ofgem Strategic Innovation Fund (SIF) Community Forum 2026, held at the Science Museum in London. They attended to represent the SIF Beta projects undertaken by the HVDC Centre, Network DC and BLADE.



The forum brought together innovation teams from across the UK energy sector to share learning from SIF Beta projects and to strengthen cross industry collaboration.

A key theme was customer insight, with live feedback highlighting the importance of clear, authentic communication and a strong focus on demonstrable customer benefits.

The forum also focused on deployment, exploring barriers that slow the transition of proven innovations into business-as-usual operations and the role of regulation, ownership, and knowledge sharing in accelerating impact.

The event provided valuable opportunities to connect with other SIF projects and regulators, supporting the HVDC Centre's ongoing role in bridging innovation, research, and de-risking the real-world deployment across the electricity networks.

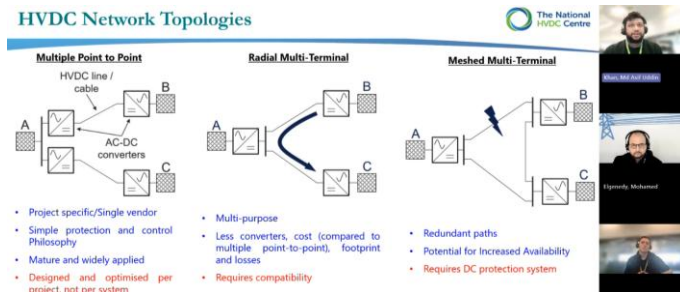


Arpan Jana

HVDC Centre hosts first webinar on multi-terminal HVDC systems

On 3 March 2026, The National HVDC Centre delivered the first webinar in its Multi-terminal HVDC webinar series, providing an accessible introduction to the technical and operational challenges associated with moving from point-to-point HVDC links towards multi-terminal and meshed DC networks.

The session formed part of the Centre's wider dissemination activity and drew on material developed across recent innovation and research projects.



HVDC Network Topologies

Multiple Point to Point

- Project specific/Single vendor
- Simple protection and control Philosophy
- Mature and widely applied
- Designed and optimised per project, not per system

Radial Multi-Terminal

- Multi-purpose
- Less converters, cost (compared to multiple point-to-point), footprint and losses
- Requires compatibility

Meshed Multi-Terminal

- Redundant paths
- Potential for increased Availability
- Requires DC protection system

The webinar introduced the fundamentals of multi-terminal HVDC, highlighting why such architectures are increasingly relevant for offshore wind integration, network reinforcement, and long-term system flexibility.

Particular attention was given to energisation sequences, control concepts, and protection considerations, using simplified examples to illustrate why these aspects become more complex as HVDC systems scale beyond two terminals.

Content was informed by studies and experience from the HVDC Centre and partners, including work on EMT modelling, real-time simulation, and system-level behaviour during abnormal conditions. The session was aimed at a broad technical audience, including transmission owners, system operators, engineers, and researchers seeking an overview of the challenges and opportunities associated with multi-terminal HVDC.

The recorded webinar is available as part of the HVDC Centre's ongoing series, which will continue to explore multi-terminal HVDC topics in greater depth.

Webinar material and recording can be found here:

www.hvdccentre.com/films-list/webinar-multi-terminal-hvdc-part-1-introduction-and-energisation/

Asif Khan, Adam Scott, Mohamed Elgenedy

Network DC Project Completion

The Network DC project has completed its Strategic Innovation Fund (SIF) Beta phase, marking an important milestone in building readiness for future multi-terminal HVDC networks in Great Britain.

The project has focused on addressing one of the key technical barriers to meshed HVDC grids: the specification, control, and protection of DC circuit breakers (DCCBs) within realistic DC network scenarios.



Led by SSEN Transmission, the project brought together The National HVDC Centre, SuperGrid Institute, the University of Edinburgh, Carbon Trust, Mott MacDonald, and NESO to assess the feasibility of DCCBs using a GB-relevant 12-terminal HVDC use case centred on a DC switching station. Detailed studies were carried out across multiple simulation platforms, including real-time simulation, to evaluate fault behaviour, DC reactor sizing, grounding approaches, and post-fault recovery strategies.

The work confirmed that a vendor-neutral and technically feasible DCCB specification can be developed and applied within a practical DC grid control and protection philosophy, including the potential for retrofit in future networks. Findings also highlight the importance of coordinated control, fast protection operation, and appropriate pre-fault operating conditions.

Network DC provides a strong technical foundation for future innovation, real-time testing, and engagement with manufacturers as Great Britain moves towards more flexible and resilient HVDC grid architectures.

A recording of the end of phase webinar is available on the HVDC Centre website:

www.hvdccentre.com/films-list/webinar-network-dc-project-mar-2026/

Colin Foote

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Visit to the Power Networks Demonstration Centre (PNDC)

On 31 March 2026, engineers and some members of the senior management team from The National HVDC Centre and SSEN Transmission visited the Power Networks Demonstration Centre (PNDC) in Cumbernauld as part of ongoing efforts to foster technical engagement and collaboration.



The visit included a short overview of PNDC, a guided tour of the facilities, and an open technical discussion on potential future collaboration and knowledge sharing in the areas of mutual interest.



The National HVDC Centre and SSEN Transmission would like to thank PNDC for hosting and supporting the visit, and for facilitating an informative overview of PNDC and its capabilities.

Further details about the University of Strathclyde's PNDC facilities can be found here: <https://pndc.co.uk/>

Arpan Jana

Graduate Placement

Suvikrant Singh Pathania has spent 3 months with us on placement at the HVDC Centre and will be returning to SSEN Transmission's Offshore Engineering team in May.

He has supported us in carrying out PowerFactory to RSCAD conversion to enable modelling of networks in RSCAD for EMT simulation studies as well as other project work around the Centre. In addition, Suvikrant has acted as a tour guide for our 'Introduction to HVDC and Project De-Risking' training days and attended the visit to PNDC to grow his understanding of the scope of research institutions.

We wish Suvikrant the best for the remainder of his Graduate Scheme as he returns to the Shetland 2 team to work on placement with the cables and converters teams.



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