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ABB drive and motor helps Narec to develop new marine renewable energy systems

An ABB medium voltage drive and 12-pole motor are providing the motive power for a new test facility for proving marine energy generating systems.

Project Nautilus, constructed at the National Renewable Energy Centre, Narec, in Blyth, Northumberland, is the world's first drive train test facility dedicated to the requirements of the marine renewables sector. It aims to remove the risks associated with in-field power generation by allowing Narec's customers to perform extreme event and accelerated lifetime testing of new tidal power generation devices in a controlled, onshore environment.

The test facility can mechanically and electrically load the complete drive train with the full envelope of loads, including side loads on to shafts. The ABB 3 MW drive system is capable of testing the complete drive train, electrical generation, control and support systems of marine renewable devices.

ABB was chosen for the project because it could supply a complete turnkey package of drive, motor, switchgear, ancillary equipment and the portable equipment buildings to house them. The company also has a proven track record of using this type of drive in similar test facilities.

A 12-pole 3,256 kW, water-cooled ABB motor acts as the prime mover in the test facility. The motor, which weighs almost 60 tonnes, is designed to develop a high torque with speed accuracy to meet the demands of the test programme. The motor uses hydrostatic bearings and a lubrication and jacking system is incorporated into the motor pedestal.

ABB's ACS 6000 is a modular medium voltage AC drive system that can be configured in single or multi-drive solutions on a common DC bus. The 3 MW drive system for Nautilus features a 24-pulse input rectifier for low harmonics. This feeds a common DC bus to which two 11 MVA rated inverter sections are connected.

The two inverter sections feed the prime mover motor double winding. A braking chopper is also connected to the DC bus. This allows fast braking of the test facility and device under test in the event of a process or emergency stop requirement and allows energy to be dissipated from the test facility in the event of a mains network power outage. The high power density and compact design and the drive's communication abilities minimise the overall installation and operational costs.

ABB's DriveMonitor system is fitted to the ACS 6000. This is an intelligent monitoring and diagnostic system and provides secure access to the drive from any location in the world. ABB also supplied medium and low voltage switchgear, and oil filled input transformer, three oil filled distribution transformers and two portable equipment buildings to house the ACS 6000 variable-speed drive, low voltage and medium voltage switchgear.

"We have been really pleased with ABB's performance," confirms Tony Quinn, Operations Director, Narec. "Projects of this nature are rare; they are one-off in terms of scale and technicalities. It takes a very special team to pull together and overcome the inevitable hurdles. ABB, with its extensive knowledge of test facilities and one-off projects, provided an exceptional project management team: they were

positive, nimble and reactive. As Operations Director, my job is to get involved when things go wrong. I did not have to get involved with ABB at all.

ABB (ABBN: SIX Swiss Ex) is a pioneering technology leader in power grids, electrification products, industrial automation and robotics and motion, serving customers in utilities, industry and transport & infrastructure globally. Continuing a history of innovation spanning more than 130 years, ABB today is writing the future of industrial digitalization with two clear value propositions: bringing electricity from any power plant to any plug and automating industries from natural resources to finished products. As title partner in ABB Formula E, the fully electric international FIA motorsport class, ABB is pushing the boundaries of e-mobility to contribute to a sustainable future. ABB operates in more than 100 countries with about 147,000 employees. www.abb.com

National Renewable Energy Centre (Narec): Narec has invested over £150 million of UK Government, private sector and European Union funding to create a unique integrated portfolio of testing and research facilities, operated on an open-access, commercial basis in Blyth, Northumberland, England. The 3MW Drive Train Test Facility is jointly funded by the Department for Business, Innovation and Skills and the Department for Energy and Climate Change (£10.3m), and by the European Regional Development Fund (ERDF), managed by the Department for Communities and Local Government, securing £6.4m ERDF investment. For further information, please contact Steve Abbott, Corporate Affairs Manager on 01670 357 621 / 07766 498 068, or email: steve.abbott@narec.co.uk

Caption: An ABB medium voltage drive and 12-pole motor are providing the motive power for a new test facility for proving marine energy generating systems.

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For more information please contact:
Layla Hewitt
Marketing Communications
Phone: 01925 741517
Email: layla.hewitt@gb.abb.com

ABB Ltd.
Daresbury Park
Daresbury
Warrington WA4 4BT

Emma Jenkinson
Armitage Communications
Phone 020 8667 2218
Email: emma.jenkinson@armitage-comms.co.uk