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Catapult leads joint industry project to improve tidal turbine powertrain reliability

The Offshore Renewable Energy (ORE) Catapult has launched the first phase of a three-stage collaborative industry project aimed at improving the reliability of tidal turbine powertrains by reducing risk at the design phase and aiding design optimisation. Improved reliability will increase energy output and ultimately drive down the cost of marine energy.

Tidal turbines suffer similar operational issues to wind turbines, but the costs associated with retrieving and reinstalling a tidal turbine, and the loss of income from power generation, can be significant, driving up operation and maintenance costs and therefore the cost of marine energy.

Building on the existing turbine testing capability at ORE Catapult’s 3MW Drive Train facility in Blyth, Northumberland, the collaborative project with partners Ricardo and DNV GL will address the unique reliability issues faced by a tidal turbine powertrain in converting energy to electricity. The three phases of the project are:

1. Identify existing data on tidal turbine reliability and any data gaps, and define a process and simulation methodology to better predict degradation or potential failure, as well as the reliability of a tidal turbine.
2. Gather data through planned live testing, and develop a range of tools which can be employed at the design stage.
3. Produce a recommended best practice guide on design optimisation.

Collectively, these measures will increase confidence in tidal technology. Other leading tidal turbine developers and universities have also offered their support to further developing the project.

The project will draw on reliability data and generic lessons learnt and from many industries including offshore wind, oil and gas, defence, automotive and rail. Until now, research into tidal turbine reliability has been segmented and product specific, lacking a systematic and industry wide approach. But fully understanding the key areas of reliability can help developers further optimise systems, thereby helping to bring down the cost of energy.

ORE Catapult Marine Sector Specialist Simon Cheeseman said: “Improving the reliability of tidal turbine powertrains, and being able to more accurately predict failure rates at the design stage, will significantly increase investor confidence in tidal turbine technology and will ultimately reduce the cost of tidal energy to the consumer.”
“This project allows ORE Catapult to further develop our knowledge and expertise with regards to tidal turbines reliability issues, and offer an enhanced service from our existing tidal turbine test facility, offering value-added services that are highly attractive to industry.”

Ricardo’s global market sector head for clean energy and power generation, Paul Jordan added: “Ricardo is delighted to be performing a leading role in this project in which we will apply our extensive experience in renewable energy to the development processes of tidal powertrain systems and components.

“Understanding the key factors behind reliability and the lessons learnt from more established industries such as automotive, defence and wind energy, will allow us to establish a robust ‘Design for Reliability’ methodology for tidal powertrains as well as identifying areas for design optimisation and further cost of energy reduction.”

Claudio Bittencourt Ferreira, Business Development Director at DNV GL, said: “DNV GL is delighted that an important issue such as reliability is finally to be addressed in a robust way. DNV GL have been promoting a reliability focussed industry initiative for years as it was identified by many stakeholders as well as ourselves as critical for the success of tidal power. The timing for the start of this reliability project is right as the proposed process has the need to collect real data from full scale devices to validate the process.”

Ends

Notes to editors

About the Offshore Renewable Energy Catapult

ORE Catapult was established in 2013 by the UK Government and is one of seven such Catapults set up by Innovate UK in high growth industries. It is the UK’s flagship technology innovation and research centre for offshore wind, wave and tidal energy and delivers prioritised research underpinned by world-class test and demonstration facilities, collaborating with industry, academia and Government to reduce the cost of offshore renewable energy and create UK economic benefit.

https://ore.catapult.org.uk

About Ricardo

Ricardo plc is a global, world-class, multi-industry consultancy for engineering, technology, project innovation and strategy. Our people are committed to providing outstanding value through quality engineering solutions focused on high efficiency, low emission, class-leading product innovation and robust strategic implementation. With almost a century of delivering value through technology, our client list includes the world’s major transportation original equipment manufacturers, supply chain organizations, energy companies, financial institutions and governments. Guided by our corporate values of respect, integrity, creativity & innovation and passion, we enable our customers to achieve sustainable growth and commercial success. For more information, visit www.ricardo.com.

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In the energy industry, DNV GL delivers world-renowned testing and advisory services to the energy value chain including renewables and energy efficiency. Our expertise spans onshore and offshore wind power, solar, conventional generation, transmission and distribution, smart grids, and sustainable energy use, as well as energy markets and regulations.

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