New-wave connector buoys off-shore energy sector

January 10 2018

Credit: Brunel University

A new multi-material connector predicted to rinse running costs for the renewables industry launches at Brunel University London in front of experts in wind, wave and tidal energy.

Connectors are key components that join moorings for floating devices such as tidal energy converters with their anchors.

A novel material developed by Brunel's Experimental Techniques Centre and the Brunel Centre for Advanced Solidification Technology forms the centre of the new connector. Called Basaltium, it's made from recycled aluminium strengthened by tiny basalt fibres.

The Basaltium core is coated in another innovative material called Oilon – a low-friction nylon from plastics makers Nylacast.

Together, these new materials, Basaltium and Oilon, make connectors lighter and tougher, and mean moorings can last longer and cost less to manufacture and maintain.

Designed firstly for floating wave energy converters these connectors are the work of STORM (Specialised Thimbles for Offshore Renewable Marine energy) – a project by Tension Technology International (TTI), Brunel University London, Nylacast and the European Marine Energy Centre.

Many 'penguin'-type wave energy converters float on the sea surface while the movement of the waves powers a turbine inside. The electricity they generate is harvested via cables embedded in its mooring ropes, which take a hammering from the sea and its wildlife.

Credit: Brunel University

"Connectors between the mooring ropes and the device are one of the main challenges for offshore renewable energy," said Dr. Lorna Aguilano from the Experimental Techniques Centre. "Generally, at connector point, the ropes deteriorate and end up breaking, with big costs for retrieval. So normally the ropes are changed every five years to avoid this.

"Our team here at Brunel have developed a new extra-light material that, when incorporated in Nylacast's low-friction nylon and used to make the innovative connector designed by TensioTech, would solve this problem – increasing the in-service life, minimising capital expenditure and maintenance costs."

The converters launch on 26 January at a Marine Moorings Masterclass at Brunel's Uxbridge campus. The team behind them is staging the event to get offshore energy industries, including oil and gas, to swap notes about working with marine moorings.

Ocean energy is a developing industry and the masterclass aims to identify gaps in the industry, and spark new partnerships and projects to advance this vital component.


2

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"Mooring systems are critical for the success of offshore floating renewable energy devices," said Project Manager Nigel Briggs at TTI.

"STORM has designed a new multi-material hybrid connector which we want to share with the industry. We want to bring together moorings experts, offshore energy developers and supply chain companies to share challenges and learning around marine mooring and discuss developing, testing and operating solutions for this vital marine energy subsystem."

More information: STORM (Specialised Thimbles for Offshore Renewable Marine energy) is funded by Innovate UK, and led by Tension Technology International (TTI).

The innovation uses the next generation of nylon/Aluminium composite materials which, when combined, exhibit higher strength, high corrosion resistance, low coefficient of friction, and are lightweight. For offshore renewable energy devices, this will raise energy output and improvement in safety, while reducing failures and offshore maintenance.

Provided by Brunel University

Citation: New-wave connector buoys off-shore energy sector (2018, January 10) retrieved 23 June 2024 from https://phys.org/news/2018-01-new-wave-connector-buoys-off-shore-energy.html

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