

# TRANSPAR: A CRAFT WITH A RADICALLY DIFFERENT APPROACH

**B**y 2020, wind farms with as many as 2,500 turbines are expected to be built up to 285 km from shore—more than ten times as far offshore as current wind farms. This will present a new set of challenges for the marine industry. One of these is providing a stable platform in harsher wave conditions for the transfer of personnel and equipment during maintenance operations. ExtremeOcean Innovation thinks it has the solution in the TransPAR craft.

St. John's, Newfoundland-based ExtremeOcean Innovation submitted the design for the TransPAR to the Carbon Trust Offshore Wind Accelerator (OWA) Access Competition. ExtremeOcean Innovation is now one of 13 finalists of 450 entries worldwide.

According to the OWA's Access Competition's "Competition Specification and Overview" document, current vessels used for this purpose are capable of effecting transfers in conditions up to 1.5 meter significant wave height. The competition solicited proposals for solutions that would enable access in conditions with a significant wave heights of 3 meters."

The TransPAR craft is "radically different from any other vessel design," according to the Carbon Trust web site. It has two vertical struts with foil sections that intersect with the water surface, creating a small water plane area. Because of this, wave action will result in minimal disruption to the vessel. A crew cabin 3.5 meters above the water surface and a heavy-hulled propeller-driven bottom provide a center of buoyancy that is above the center of gravity—the same design principle that ensures that submarines don't roll over underwater. The design also allows the TransPAR craft to approach and connect to offshore wind turbine foundations safely. The vessel is 5.5 meters long and 15 meters high, displaces 15 tonnes, and has a 3.5-meter beam and a 9-meter draft.

Safety features include reduced vessel motions, improved operator visibility, a clear working deck, and a provision for simulator training to be used for both operators and technicians prior to operating the vessel in real world situations.

ExtremeOcean Innovation anticipates that the TransPAR craft will increase access to offshore wind turbines by at least



30% over vessels that are currently available. By enabling safe transfers at 3 meters, the propelled spar vessel is expected to increase access time to 310 days per year from 200 days per year currently.

By providing the means to transfer personnel and equipment in 3 meter waves, explains ExtremeOcean Innovation's CEO Peter Gifford, the TransPAR craft will enable the European Union to meet their stated objective of generating 58 GW of wind energy by 2020.

The Competition specified an operational profile based on a central "mother-ship" and "daughter" craft to carry out the transfers via a hub-and-spokes scenario. The transfer vessel is to service up to 2,500 windmills located up to 300 km from shore in 15 m to 70 m water depth, with significant wave height of 3 meters.

ExtremeOcean Innovation is currently building a model that will be tested in early November in a tow tank. They will submit their test results to the Carbon Trust in early January



**Peter Gifford, CEO, ExtremeOcean Innovation (left) and Dr. Brian Veitch, Chief Technical Officer, ExtremeOcean Innovation**  
Photo: Andrew Safer

2012, and then advance their conceptual design and submit a capital/operational costs and conceptual design package by the end of February 2012.

Successful applicants receive funding up to 100,000 GBP per concept to support the design and development of the vessel, and additional funding is available from the Carbon Trust to take each

concept to full-scale demonstration. The finalists also have the opportunity to work with eight leading offshore wind developers that have licenses to develop 30 GW of offshore wind capacity in UK waters (representing 60 per cent of current licensed UK capacity): Dong Energy, EON, Mainstream Renewable Power, RWE Innogy, Scottish Power Renew-

ables, SSE Renewables, Statkraft, and Statoil.

The TranSPAR design was developed by Dr. Brian Veitch and Dr. Bruce Colbourne, professors in the Faculty of Engineering and Applied Science at Memorial University, and Gifford, a 26-year-old Master's degree student in Ocean and Naval Architectural Engineering.

"The main requirement was to provide a stable floating platform to offload onto a fixed platform, and it came to me immediately," recalls Veitch. "I drew a sketch of a little cabin on top of a long spar, with a heavy hull at the bottom. It's basic naval architecture." Gifford built a simple foam and aluminum model that put in the tow tank at Memorial University's Offshore Engineering Research Centre to make sure it would float. After conducting a patent search, Gifford discovered no such design existed. With the assistance of the Genesis Centre at Memorial University, he and Veitch filed for a provisional patent in the US. **ML**

DERRICK BARGE WITH **OFFSHORE WIND ON ITS MIND**

Marine engineering and naval architecture consulting firm Zentech, Inc., Houston, TX, has acquired the former *Derrick Barge 23* from Bohem Crane and Equipment Repair LLC, LaMarque, TX.

"We intend to upgrade the vessel in two phases, first for use as a crane barge with increased lifting capacity, and later as a much larger self-propelled jackup vessel for wind farm installation service," says Zentech President Ramesh Maini. The vessel is being prepared for conversion work at a Gulf Coast shipyard.

Renamed the *ZEE RIG 3*, the vessel is 400 ft long, 100 ft wide and has a hull

depth of 29 ft. It is outfitted with an AmClyde Model 52 marine crane that will be initially upgraded to 800 U.S. tons with a 275 ft boom length.

Phase Two of the upgrade will transform *ZEE RIG 3* into a much larger DP-II self-propelled jack-up, with the width increasing from 100 ft to 176 ft. It will be capable of operating in 200 ft water depth.

The main crane will be uprated to 1,100 U.S. tons, and quarters accommodations will be added above-deck. This conversion will be completed in the fourth quarter of 2012.

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**Installation Work**

Zee Rig 3 (former DB-23) is being upgraded in two phases, first for use as a crane barge with 800 ton lifting capacity, and later as a much larger DP-II jackup vessel for wind farm installation work, construction work, or P&A duty, with a 1,100 ton lifting capacity.



**Accommodations & Service Work**

Zee Rig 1 is a Semi-SWATH vessel, 237 feet long by 95 feet wide, suitable for ROV / Diving Support, as a 300 person Accommodations Vessel, or for wind farm maintenance and service work.

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