Rexroth lifts wind energy to new heights
High performance jacking systems for offshore wind turbine installation vessels

MPI’s two six-legged wind turbine installation vessels, the Adventure and Discovery, and BARD’s four-legged vessel, Windlift 1, employ Rexroth drive and control systems for the jacking function, with capacities of up to 22,500 tonnes.

With its first successful delivery of an advanced hydraulic jacking system coming five years ago, Rexroth has announced a further three wind turbine installation vessel projects.

Offshore wind is one of the most exciting sectors in the global renewable energy industry. For the installation of the wind turbines, offshore wind farm developers require vessels with a specially-designed jacking system to raise the mill to operational level. Unlike traditional oil and gas units, where jacking only occurs occasionally, these vessels require a high performance hydraulic jacking system for fast operation to provide the safe, stable working platform that remains operational well beyond the limits of a weather window.

There are three new vessels currently equipped with Rexroth drive and control systems for the jacking function, with jacking capacities of up to 22,500 tonnes. MPI’s two six-legged wind turbine installation vessels, the Adventure and Discovery, have a jacking capacity of 3,750 tonnes per leg and a 500 tonnes column crane that can lift to a height of 31 metres. BARD’s four-legged vessel, Windlift 1, can lift 2,650 tonnes per leg and has a large 1000 tonne crane at 25.5 metres.
The technology employed by Rexroth is based on the single or double yoke jacking concept, which meets the demands of wind turbine elevation systems that require frequent jacking operations at high speed – the four legged platforms are lifted by 32 cylinders; the six legged by 48 cylinders. All cylinders have a corrosion resistant Ceramax ceramic rod coating to protect against the harsh maritime environmental conditions ensuring a longer life time.

For each pair of legs a hydraulic power unit (HPU) is used and, depending on the required jacking capacity of each leg, Rexroth specified units from 1.1 to 1.7 MW. Special attention was also given to system stability, platform levelling and controllability of the platform, even during the increased lifting speed mode. Additional features for increased platform lowering are also available. Also, the Rexroth HPUs provide power to the mooring winch, crane and sea-fastening systems, and the associated control system enables operation to switch between manual and fully automatic modes.

Being a recognized specialist in worldwide offshore operations, Rexroth has the breadth of product range needed to act as a true single-source, and can provide design, manufacturing, project execution and support throughout the life of the equipment, whether it be five, ten or even twenty years. Also, as a global company, Rexroth can support the system wherever it’s stationed.

Throughout the project Rexroth employed its specialist fatigue knowledge in engineering design to meet the requirements frequent jacking operations would demand during a service life of 20 years or more. Rexroth also ensures that its elevation systems are designed, tested and delivered according to the appropriate certifying authorities, which include Germanischer Lloyd and DNV (det Norske Veritas).

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Editor’s Notes:
Bosch Rexroth AG is one of the world’s leading specialists in the field of drive and control technologies. Under the brand name of Rexroth the company supplies more than 500,000 customers with tailored solutions for driving, controlling and moving machinery used in industrial and factory automation as well as in mobile applications. Bosch Rexroth is a partner for industrial applications and factory automation, mobile applications and using renewable energies. As The Drive & Control Company, Bosch Rexroth develops, produces and sells components and systems in more than 80 countries. In 2008 Bosch Rexroth AG, part of the Bosch Group, achieved sales of around 5.9 billion Euro with 35,300 employees.

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