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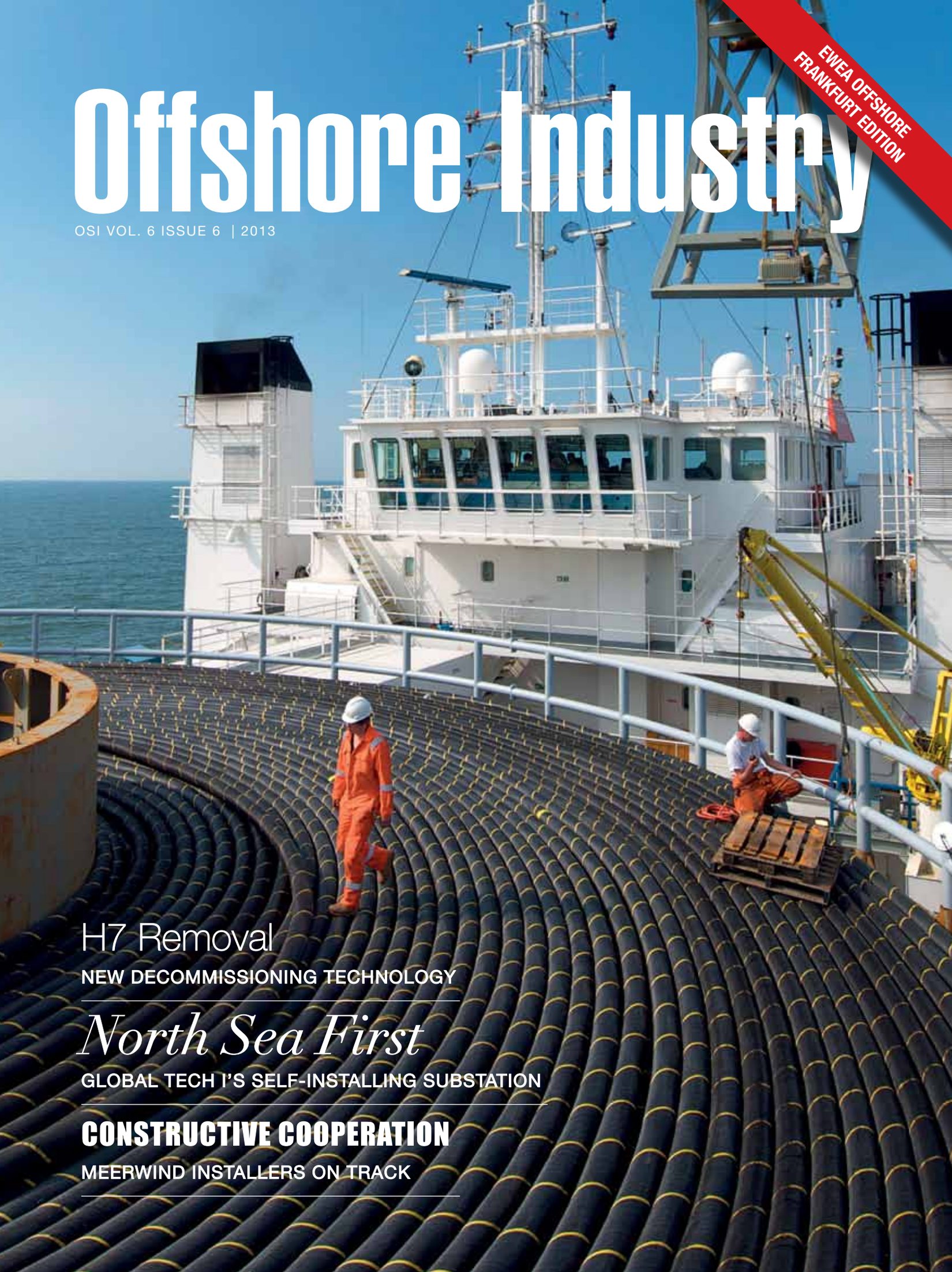

H7 Removal

NEW DECOMMISSIONING TECHNOLOGY

North Sea First

GLOBAL TECH I'S SELF-INSTALLING SUBSTATION

CONSTRUCTIVE COOPERATION

MEERWIND INSTALLERS ON TRACK

GLOBAL TECH I'S MOBILE SUBSTATION WITH SUCTION PILES

Self-Installing Wind Platform

WORDS BY JOHN GAULDIE

By November Global Tech I Offshore Wind GmbH expects to complete commissioning of its offshore substation platform with an interim grid connection to TenneT's BorWin alpha.

Global Tech I's substation is not only the first use of the self-installing Mobile Offshore Application Barge (MOAB) concept for a German wind farm, but also the first suction pile installation. Overcoming the challenges of being the first, the completed substation demonstrates a viable alternative to conventional platform design.

North Sea First

A consortium of Alstom Grid and Keppel Verolme completed construction and installation of the MOAB substation in May. Although a new concept for the offshore wind industry, Keppel Verolme had already completed MOAB fabrication, including a platform for Perenco UK at the Trent field complex in the UK southern gas basin.

Arjen Schampers, Technical Managing Director of Global Tech I Offshore Wind GmbH: "We adapted a method from the oil and gas industry to install our transformer station and this is the first time this technique has been used in the North Sea. Even when offshore wind power is pioneering work, this example clearly shows there is still much technological experience we are able to call upon in this new industry."

Florian Zschoge, Project Manager at Alstom, stated: "The self-installing platform is an interesting alternative to the traditional topsides-jacket-constructions and could further establish itself in offshore wind."

Photo courtesy of Global Tech I

Tschudi Offshore & Towage's AHTS vessels Boulder and Bluster positioning the floating MOAB 100 km north of Borkum, supported by the DP2 jack-up accommodation barge GMS Endeavour.

Photo courtesy of Global Tech I / Henthorn

Photo courtesy of Global Tech I

Rotterdam Fabrication

In their main dock in Rotterdam, Keppel Verolme built the steel structure of the Global Tech I platform, designed by the German engineering specialist Overdick (who also designed the Perenco UK MOAB). Alstom Grid installed the electrical equipment directly at the Dutch shipyard. Areva is the supplier of the high voltage transformer system. The topsides consists of seven distinct decks. The cable deck is on the lowest level and includes diesel generators that serve to supply the entire wind farm with auxiliary power for its own use in cases of interruption of the grid connection. DBR supplied the containerised emergency generator package. The central control room of the transformer station with protection and control systems and communications technology is housed on the main >>

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Photo courtesy of Keppel Verolme

The Global Tech I MOAB under construction at the Keppel Verolme yard in Rotterdam, showing the suction caissons.

deck. Due to their extensive sizes, some of the high-voltage equipment, such as the four transformers, switchgear and reactive-power compensation chokes, are spread across both the two levels of main and intermediate decks. They are located inside the closed steel body of the platform in order to protect them from the aggressive, salt-laden atmosphere.

The working deck is the uppermost level and is constantly exposed to the weather. An offshore crane is installed here, a containerised spare parts store and a helicopter landing pad.

Accommodation Module

The Global Tech I platform also serves as the wind farm's logistical base. Around 32 technicians working in shifts around the clock will maintain reliable power generation.

For Keppel Verolme, Holland Shipyards built the accommodation module under high QA/QC demands and a strict deadline. As well as cabins, the technicians also have communal areas and a fitness room. Accommodating the service teams on the platform allows economic operation of the offshore wind farm, which lies at a distance of 180 km from Bremerhaven.

Minimal Logistical Demand

The Global Tech I installation was the first use of substation suction piles in the German Bight. Two AHTS vessels, Tschudi Offshore & Towage's Boulder and Bluster towed the floating MOAB from Keppel Verolme's Rotterdam yard to the offshore site 100 km north of Borkum. In total four tugboats were needed for positioning. The installation was supported by the DP2 jack-up accommodation barge GMS Endeavour. The MOAB's legs were lowered 40m to the seabed, anchored by the suction caisson's mounted on the four feet.

Experienced in suction pile foundation projects, SPT Offshore completed the installation with its suction pump spread. Each of the steel cylinders, 9.5 m high with a diameter of 11 m, was pressed into the seabed under the weight of the 9,000t platform. In the next step, vacuum pumps drew out the seawater in the cylinders from above, thereby producing a negative pressure that pulled in the seabed from beneath the suction caissons.

The platform was then raised 20m above sea level. The installation method requires minimal offshore installation resources and is environmentally-friendly, avoiding undersea noise constraints from pile driving. The platform can be safely removed at the end of its lifetime by reversing the installation procedure.


Photo courtesy of Keppel Verolme

Farm Progress

The cable installation vessel CS Sovereign, operated by Global Marine Systems Energy (GMSE), laid the Global Tech I cables. Conbit Engineering's lifting crew supported the cable pulling company, Prysmian Group by installing lift booms in two corners of the offshore substation. The export cable will later be connected to the delayed BorWin beta HVDC platform.

Installation of Global Tech I's 5MW wind turbine towers and nacelles commenced this autumn with Hochtief Solutions wind installation vessel Thor. In December Hochtief Solutions' new heavy-lift jack-up vessel Vidar from the Crist shipyard in Poland is expected in the construction field to install the rotor stars. According to the Global Tech I Offshore Wind GmbH spokesperson, completion and commissioning of the wind farm is presently expected by summer 2014.

i. www.globaltechone.de