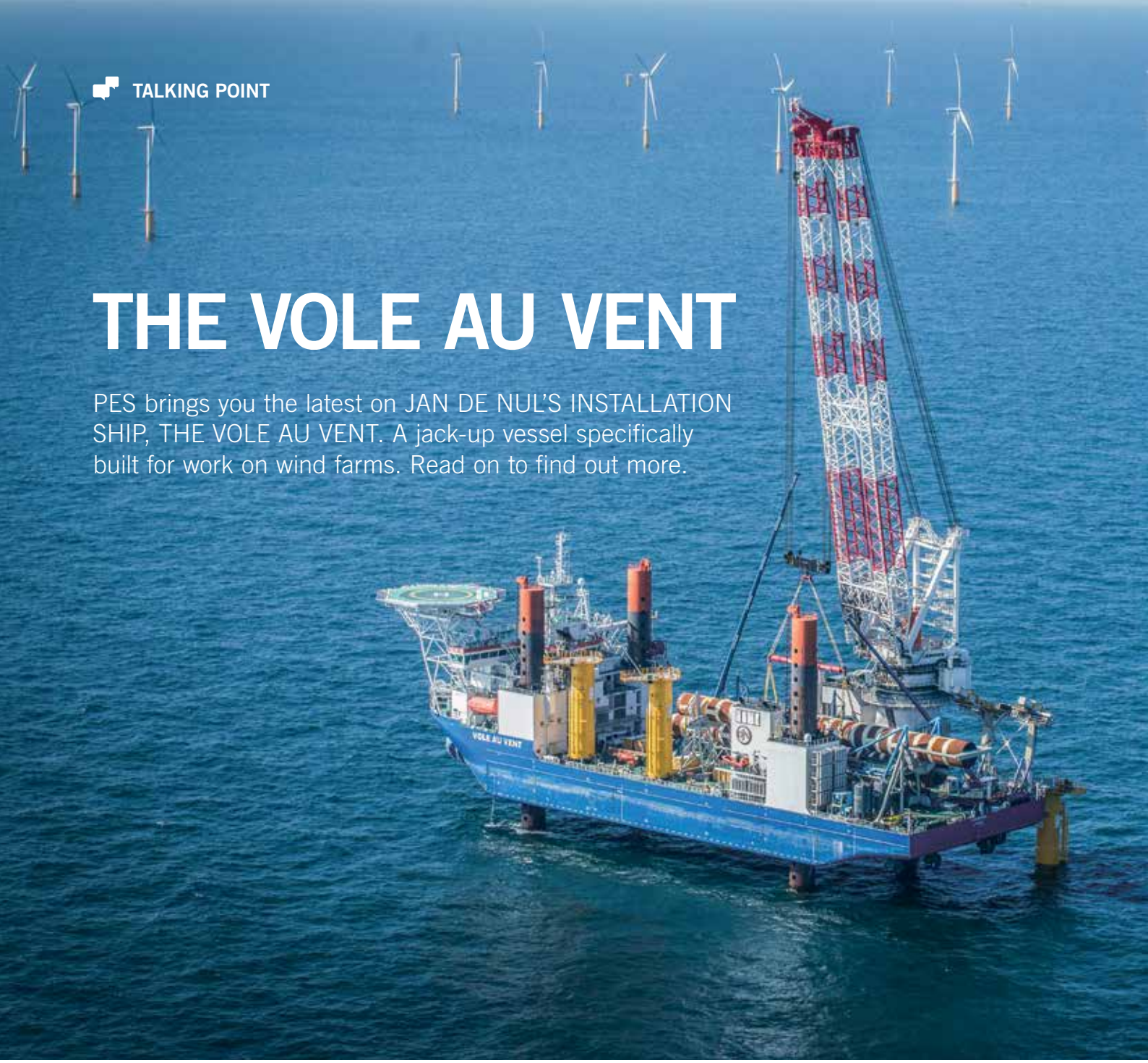
THE VOLE AU VENT

PES brings you the latest on JAN DE NUL'S INSTALLATION SHIP, THE VOLE AU VENT. A jack-up vessel specifically built for work on wind farms. Read on to find out more.



On Tuesday September 15th 2016, JAN DE NUL and NOBELWIND will sign the first offshore wind contract for JAN DE NUL's installation ship, VOLE AU VENT, acquired in 2015.

It is an EPCI project that includes the design (engineering), procurement, construction and offshore installation of 51 piles for 50 wind turbines and one offshore high voltage substation (OHVS), as well as supplying and installing the scour filter and armour layer and the installation of 50 wind turbine generators (WTG).

Project description

The project, popularly called the 'Nobelwind project', is in fact the 'Bligh Bank Phase II Offshore Wind Farm' and is the second phase of the Bligh Bank concession 'Belwind', in the Belgian North Sea, which was granted by the Belgian Ministerial Decree, June 5th 2007.

The following companies, Parkwind NV (41.08%), Sumitomo Corporation (39.02%) and Meewind (19.9%), are the main shareholders of the employer, Nobelwind NV.

The new offshore wind farm will be built around the current power producing Belwind farm. The 50 wind turbines are to be supplied, installed and maintained by MHI Vestas Offshore Wind (MVOW) and they will produce 3.3 MW each, totalling 165 MW. These turbines will be loaded in Esbjerg, Denmark, ready to be mounted on the 100m high foundation.

The windfarm will be connected via an export cable, which was installed onto the Belgian electricity grid in 2013 by JAN DE NUL. This supplies green electricity to about 186,000 households. The entire area of the park is 22 m2and will provide an annual CO2 reduction of approximately 197,000 tonnes.

The marshalling harbour is the Port of Ostend, to which both monopiles and transition pieces will be brought to be loaded on the installation vessel, VOLE AU VENT.

Design

Ramboll carried out the design of the foundation, which consists of a monopile and transition piece. Thanks to joint experience, numerous lessons learned from a few decades of designing and detailed engineering, both the monopile and transition piece foundations have been included in the present design.

Thorough design risk assessments take into account the operational aspects and constructability of the structures and in particular, for the OHVS monopile, OHVS transition piece and OHVS J-tube cage, the so-called 'bird cage', are being treated as a separate project within a project.

The entire WTG structure consists of a large-diameter, thick walled, steel monopile driven into the seabed by using the hammering technique, a transition piece which is bolted to the monopile, while the WTG consists of a tower, nacelle with generator and 3 blades.

Monopiles (MP)

Monopile foundations have proved to be an efficient solution where there are reasonable ground conditions and in water depths up to 35 meters, which is the case in the Blighbank concession. These piles resist lateral wind and wave loading and subsequent moments, by mobilising horizontal earth pressures in competent near-surface soils.

Since its introduction in the offshore industry, the monopile has become larger, heavier and also been installed in deeper waters.

The monopiles for Blighbank 2, with a variable length up to 77m and weights ranging from 430 to 800 metric tonnes, are being manufactured in Rostock, by EEW Special Pipe Constructions, a specialist fabricator of monopiles in Germany.

Transition Piece (TP)

CS Wind, a South Korean steel company, experienced in building wind turbine towers, is producing the 51 Transition Pieces, which will connect the monopiles with the 50 turbines and 1 will be used as a support for the OHVS.

The transition piece is situated in the transition area between the salty water, the drying air, the hot sun or in icy winters. It is therefore exposed to extremely corrosive conditions. The TP therefore requires specific corrosion protection, which is subject to a particularly strict, quality control.

Typically the TP contains, amongst other things, a boat landing and a work platform. The latter is assembled in the marshalling harbour, Ostend, after arrival.

Scour protection

The mining and fall pipe vessel Simon Stevin is used for the filter layer and the armour rock for scour protection. With a rock carrying capacity of 31,500 tonnes, this fall pipe rock dumping vessel is, along with its sister vessel, Joseph Plateau, the largest of its kind in the world and one of the few vessels equipped for rock dumping in water depths of 2,000 m. Besides the very large operational depth, a unique feature of the vessel's feeding system to the fall pipe is its capacity to deal with rock sizes of 400 mm, which is more than any other fall pipe vessel.

Process of offshore installation

The process of installation starts with the construction of the filter layer for scour protection. JAN DE NUL's heavy lift jack-up vessel, VOLE AU VENT, is equipped with a pile gripper, which holds the monopile in place, after having been upended and lifted with special lifting tools. Then the hydro hammer drives the pile through the filter material of 1-200mm.

Once the pile is in position, the TP is bolted on to the MP and the annular void between the grout skirt of the TP and the MP are filled up with grout for corrosion protection reasons. The VOLE AU VENT installs 4 MP's and 4 TP's per installation cycle.

After the installation of the temporary TP cover, also known as the Chinese hat, the TP is left until the cables are installed. Then the armour rock is placed as a the final scour protection.

WTG transport and installation

The last stage for JAN DE NUL will be the transport and installation of the WTG's. This is another job for the VOLE AU VENT. It is equipped with custom made sea fastenings and can transport 8 entire WTG's consisting of towers, nacelles and blades. This installation will take place in the second part of 2016. ■

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VOLE AU VENT

The jack-up vessel VIDAR was re-baptized by her Majesty the Queen of the Belgians into the VOLE AU VENT. It was specifically built to install offshore wind parks. The vessel is one of the largest of its kind in the world. The large cargo deck, the payload and the lifting capacity of its crane of up to 1,400 tons, enables swift and safe installation of the heaviest foundations and other components for offshore wind parks. The vessel is 140 m long and is equipped with four legs to lift itself above sea level for stable working, without impact from the waves. The vessel can install all kinds of foundations, as well as the latest generation of wind turbines, in water depths up to 50 m.

Although specifically built with the offshore wind industry in mind, the VOLE AU VENT is also suitable for other offshore installations, such as tidal current turbines, wave energy generators, met masts and Oil & Gas infrastructure.

The VOLE AU VENT can also be used for decommissioning worldwide because all of the infrastructures are exposed to offshore conditions and so have a limited life cycle.

Polyvalence of JAN DE NUL

Nic De Roeck, Project Director for JAN DE NUL, leads his team into this new challenge: 'Offshore projects are not new for JAN DE NUL, when we think of offshore rock installation, cable burying and installation and general offshore services. But it is the first time that we have this combination of a new heavy lift jack-up vessel, VOLE AU VENT, within JAN DE NUL and an EPCI offshore wind farm project with both foundation and WTG installation. This is where JAN DE NUL can make the difference. We have experienced and polyvalent engineering staff who have worked on complex projects with multiple disciplines such as dredging, civil, marine and environmental work. We are confident that we will bring this project to a successful completion. Contracts have been awarded to the team and the VOLE AU VENT until 2018, so we know what we have to do.'