Nissum Bredning

Offshore installation of four wind turbine foundations

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In the Nissum Bredning area in the western Limfjord, Per Aarsleff A/S has installed four large wind turbine foundations for four 7 MW wind turbines for the client Siemens Wind Power A/S. Each wind turbine foundation consists of a steel jacket foundation with three DN1450 mm inclined piles and a concrete transition piece. The offshore test project involved several test elements, and Aarsleff helped develop and mature the foundation concept using a wide range of our qualifications, from design and production to offshore installation.

Own design and in-house production

Aarsleff's Design & Engineering department participated actively in the development of the wind turbine foundation design, including the approx. 1,200 tons concrete transition pieces, and developed installation methods and equipment in collaboration with the offshore department.

The very low water depths in the area (1-5 metres) and the geotechnical conditions meant that the installation could not take place from a typical offshore installation barge, so we had to come up with an alternative method in order to solve this special challenge. After the establishment of access channels to the locations, we installed steel jackets and inclined piles using two large crawler cranes placed on a grounded barge. The barge was placed on a stone bed which acted as a temporary island during most of the installation work. This unusual method provided us with valuable experience regarding nearshore installation.

Then, the four 1,200 tons transition pieces were installed by means of a floating crane. Before that the transition pieces had been manufactured at Aarsleff's own factory in Swinoujscie in Poland and transported all the way to Thyborøn.

Project-specific equipment

We used our own project-specific installation equipment for the 75-metre-long and more than 100-tons-heavy inclined piles which were installed below water by means of a pile guide frame to secure precise installation. This method was never used before for offshore wind turbine installation.

The project also involved a required dredging of channels for access to the locations with the heavy floating equipment. This work was carried out in collaboration with our subcontractor Rohde Nielsen A/S. Without these access channels it would not have been possible for the installation barges to reach the area. The project was carried out in close collaboration with the client and required efficient coordination between the design, production and installation teams to ensure successful completion.

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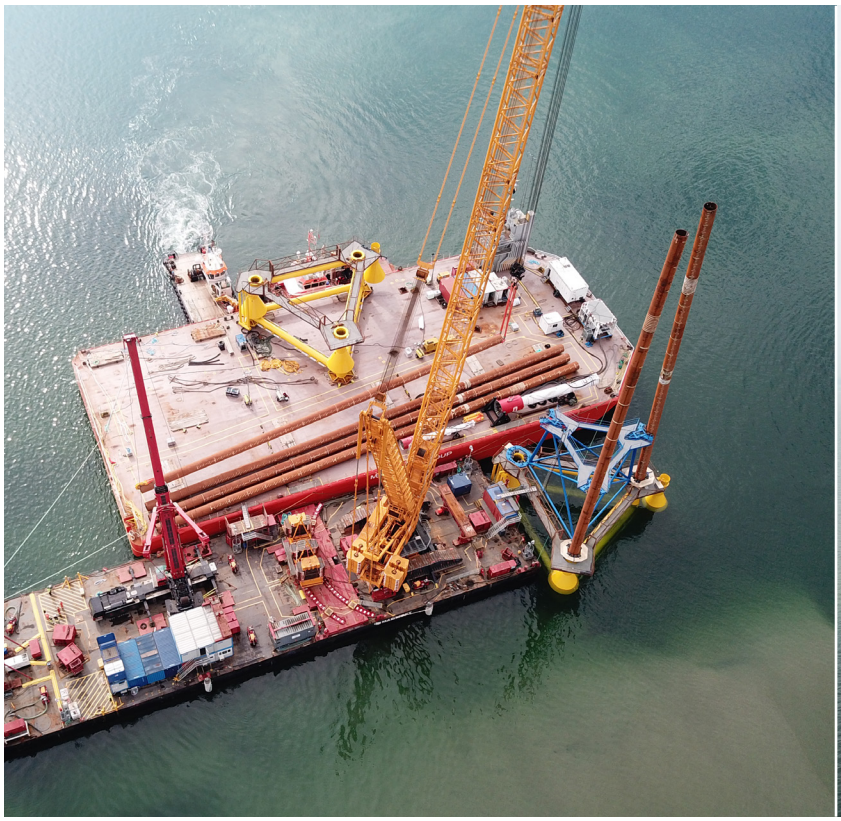

Data
- 4 steel jacket foundations each weighing 250 tons
- Installation of 12 DN1450 mm inclined piles (length 75 metres, weight approx. 100 tons)
- 4 transition pieces each weighing approx. 1,200 tons
- 200,000 m³ of dredging
- 6,000 m² of stone beds

Client
Siemens Wind Power A/S

Contractor
Per Aarsleff A/S

Collaboration partner
Rohde Nielsen A/S

Type of contract
Main contract

Consulting engineers
Rambøll Danmark A/S
cp test A/S

Construction period
December 2016–April 2018

Contract value
The client does not want to publish the contract value

Kontakt
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