

Wave impacts on fixed wind turbines II joint industry project

Publieke samenvatting / Public summary

Background

The effects of operational loads and wind loads on offshore wind turbines (OWT) are reasonably well understood. For most existing and future sites, however, the water depth is such that breaking or near-breaking waves will occur causing impulsive excitation of the foundation and consequently considerable stresses and displacements in the foundation, tower and turbine. To ensure the integrity and safety of future offshore wind turbines, (extreme) waves should be taken into account in the design.

Objective

The objective of 'WiFi II' JIP is to further extent the work that is conducted within the 'WiFi' JIP. The goal is to extent the knowledge in the area of new foundation types that are being developed at the moment, like very large diameter monopiles. Next to this the obtained results and improved design methods will be used by engineering companies for a case study, and to give feedback to DNV and GL when developing the improved classification. This last step will result in a good dissemination of the obtained knowledge within the industry partners. The 'WiFi II' JIP has the same global objectives as the 'WiFi' JIP, which is to avoid damage on wind turbine constructions at sea by means of developing improved design methods.

Short description of activities

The work plan comprises the following main

Projectinformatie / Project information

Projectnummer / Project number
TEW0314003

Subsidiebedrag / Grant amount
€ 230.139,00

Algemene informatie / General information

Penvoerder / Secretariat
Marin

Publicaties en materialen / Publications and attachments

- 28.01.2019

Eindrapport TEW0314003

Links

- WIFI JIP makes it possible to take the next step in foundation design (Marin, 2015)

Volg Topsector Energie op X / Follow Topsector Energie on X

@TSEnergie

activities performed in three main work packages:

- Experimental verification of very large diameter monopiles, by means of model tests in state of the art test facility
- State of the art numerical calculations of nonlinear wave loading on offshore wind turbine foundations
- Developing a validated fully nonlinear wave load model for the industry to use
- Industry experience and feedback by three different case study's. For this the following case study's will be performed:
 - Design of a monopile wind turbine foundation
 - Design of a jacket wind turbine foundation
 - Design of a very large diameter monopile wind turbine foundation
- Siemens will simulate the dynamic response of a wind turbine on a jacket and monopile due to wind and wave loading, and will review the new design methods from a wind turbine point of view.

Results

Thanks to the WiFi II JIP project, improved knowledge and design methods have been developed for determining the (maximum) wave load on the foundation of an OWT. With this knowledge, the project partners can design foundations in a more efficient way so that quality and costs can be reduced.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.

Voor meer informatie over de Topsector Energie, ga naar www.topsectorenergie.nl.

Voor meer informatie over de TSE / Energie-Innovatie regelingen die RVO aanbiedt, ga naar www.rvo.nl/tse.