Ice-structure interaction in application of offshore wind turbines

PhD candidate: Tim Hammer, MSc
Section: Offshore Engineering
Supervisor: Dr.ir. H. Hendrikse
Promotor: Prof. Dr. Ir. A.V. Metrikine

Description:

The increasing demand for offshore wind farms causes an exigency of new suitable construction sites. Such feasible construction sites have been identified in more Northern regions. There, interactions between drifting ice floes and vertical-sided structures are more likely to occur and can result in ice-structure interaction.

The main foundation type of offshore wind turbines are vertical-sided structures like monopiles or jackets. During design of support structures for offshore wind turbines, a main uncertainty exists related to the potential development of ice-induced vibrations which is introduced by non-linear ice-structure interaction.

Current models of ice-structure interaction are based on phenomena observed during ice basin tests and rare full-scale events of structures in ice. Model scale tests of ice-structure interaction are still limited by unsolved challenges during development of scaling laws for crushing ice.

Structure-specific properties of an offshore wind turbine as low eigenfrequencies, misaligned load case scenarios of wind and ice and bidirectional structural responses, are supposed to influence the development of ice-structure interaction.

Goal:

The goal of this research is to provide a validated ice-structure interaction model in specific application for offshore wind turbines.

Sponsors:

TU Delft SIEMENS Gamesa RENEWABLE ENERGY TKI WIND OP ZEE Topsector Energy

Contact Details:

E-mail: T.C.Hammer@tudelft.nl
Room: 3.51

Working days at TUD: Mon, Tue, Wed, Thu