

EFFECT OF LARGE WIND TURBINE ROTOR ON A MONOPILE FOUNDATION

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The rotor diameter of offshore wind turbines are increasing in size. The Dudgeon wind farm is planned to have 154 m diameter wind turbines. From studies by the Offshore Wind Accelerator it is known that one of the issues with increasing the rotor size is a coupling of the 6P and the 2nd tower bending mode. The dynamic interaction between the load components, amplifying the fatigue damage, may have a large cost impact on the offshore wind turbine foundations.

In order to study the dynamic interaction of an offshore wind turbine, a scaled version of the 5 MW reference wind turbine of NREL is modeled. The new wind turbine has an effect of 6.3 MW, a rotor diameter of 154 m and a monopile foundation. The study presented here investigates the fatigue of the monopile foundation using spectral analysis. The aim is to reduce the cost driving parameters for offshore wind turbine foundations.