

Dynamic Response of Offshore Wind Turbine under Nonlinear Irregular Ocean Waves

HADI PEZESHKI^{*}, DIMITRIOS PAVLOU[†]

AND SUDATH C. SIRIWARDANE[†]

^{*}University of Stavanger
Hadi.Pezeshki@uis.no

[†]University of Stavanger
dimitrios.g.pavlou@uis.no

[†] University of Stavanger
sasc.siriwardane@uis.no

Key words:Offshore Wind Turbine, Response, Soil-Structure Interactions, Wave-Structure interactions, 2nd order nonlinear ocean wave load, Irregular wave load.

ABSTRACT

Offshore wind turbines (OWT) are exposed to different categories of ocean waves during their lifetime. Most of the ocean waves are categorized in the 2nd order nonlinear in both normal and severe sea states and their spectra combine different heights and frequencies. In the present study, a model for the dynamic response of OWTs to the irregular 2nd order nonlinear ocean waves is proposed. The foundation-wave-structure interaction and the effect of the nacelle-rotor assembly are simulated. Numerical results are provided and discussed.