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Analysis of Wind Turbines on Offshore Support Structures

Excited by Random Wind and Random Waves

Debby S. Oscar, Thomas L. Paez
Wind Energy Research Division
Sandia National Laboratories
Albuquerque, NM 87185

ABSTRACT

A numerical approach has been developed to predict the dynamic response of structures excited by random wind and random waves, such as wind turbines at offshore locations. The software developed by this effort, called OFFSHORE HAWTDYN, calculates the displacement time response of horizontal axis wind turbines (HAWTs) attached to offshore support structures subjected to steady and random wind and wave forces that simulate ocean environments. This software utilizes the structural dynamic analysis capability of HAWTDYN, a code developed at Sandia National Laboratories, to solve the equations of motion. The HAWTDYN code was modified to permit the application of water wave loads to the structure being analyzed.