

Dynamic behavior of parked wind turbine at extreme wind speed - DTU Orbit (08/11/2017)

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In wind turbine design process, a series of load analysis is generally performed to determine ultimate and fatigue loads under various design load cases (DLCs) which is specified in IEC 61400. These design load scenario covers not only normal operating condition but also startup, shutdown, parked and other scenario which is assumed to occur during the expected lifetime of wind turbine. This research focus on vibration problem under 50-year storm conditions while rotor is parked and blades are feathered. In this parked scenario, effect of a wind direction change of up to ± 180 degrees for both cases of standstill and idling is analyzed by time domain simulations using two different coupled aero-hydro-servo-elastic codes. Trend in modern wind turbines is development of bigger, lighter and more flexible rotors where vibration issues may cause aero-elastic instabilities which have a serious impact on the ultimate loads. The DTU 10MW Reference Wind Turbine (RWT) is chosen as wind turbine model in this research.

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