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SHM of Floating Offshore Wind Turbines-Challenges and First Solutions

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The paper presents an integrated SHM-system for floater, moorings, tower, nacelle and rotor blades. Its core is based on a multivariate SHM-system for rotor blades with three different measuring techniques accompanied by appropriate signal processing approaches:

• Acoustic Emission (AE) is used for identification of relative small damages at the whole blade, e.g. bursts of fibres, cracks of bonding, hits of hail and the localization of damages.

• Acousto Ultrasonics (AU) provides information about relative small to big damages on the transfer path between emitter and receiver of guided waves (cracks, delamination, damages of the surface).

• Operational Modal Analysis (OMA) gives information about large structural modifications e.g. changes of global stiffness, mass and damping ratios in the whole blade.

The most important feature of an SHM-system, however, is not the sensor network, but the analysis capability and the decision support system reducing and interpreting measured data.

The instrumentation plan of a floating wind turbine off the coast of Spain is presented.

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Ключевые слова:

Содержание.