CM Project - Systems and methodologies for condition monitoring of wind turbine towers and blades

Operation and maintenance costs constitute a sizeable share of the total annual costs of a wind turbine. For a new machine, these costs might easily have an average share over the lifetime of the turbine, of more than 30% of the total cost per kWh produced.

The increase of the wind turbines and their size, in combination with remote locations where off-shore farms are built, means that these maintenance costs will see an unprecedented increase in the future. Therefore manufacturers are seeking to develop new maintenance strategies. The use of Conditional Monitoring allows maintenance to be scheduled, or other actions to be taken to avoid the consequences of failure, before the failure occurs.

The project focusses on developing an innovative vibration and Acoustic Emission (AE) monitoring system that will allow assessment of reliability and performance of the tower and blade structures in wind turbines as well as in wind turbine rotating machinery.

The overall technical objective is the production of an advanced Condition Monitoring System (CMS) of wind turbine machinery components and Structure Health Monitoring (SHM) utilising two techniques, specifically designed for wind turbines and their components. Operational Modal Analysis (OMA) and Acoustic Emission (AE) techniques will be used to monitor the condition of the generator, the gearbox, rotary components, blades and structure, respectively.

The project will develop as outcomes two different but similar Condition Monitoring systems, each of them designed for different applications:

- Generic system capable of developed SHM and Condition Monitoring in Wind Turbines will be developed
- Low cost system for Condition Monitoring of Wind Turbine machinery will be developed.

In combination to the Condition Monitoring system and service another important outcome of the project is the development and delivery of training material that will be given to potential users of the condition monitoring system.

For further information, please visit the project website: **www.cm-project.co.uk**

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Delivered by narec

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