CMDRIVE

Condition monitoring of wind turbine drive-trains via non-contact acoustic sensors

Background

There is an increasing trend in the wind power sector for Wind Farm Owners (WFOs) to in-source their own Wind Turbine Conditioning Monitoring Systems. This choice comes with a number of issues, in relation to current Condition Monitoring (CM) solutions (e.g. Vibrational Analysis and Acoustic Emission), primarily:

- the system sensors are intrusive and thus present difficulties during the installation process; such tampering also revokes the initial OEM warranty of the drive-train components
- CM systems are often calibrated according to the manufacturer's machinery, and hence are not specific enough to the WFO's turbines
- the European wind turbine standard EN 50308 is currently being updated in order to place stress on the development and implementation of techniques/technologies which can ensure turbine reliability, both onshore and offshore
- current ISO standards for condition monitoring (such as ISO 17359:2011) are established for the diagnosis of machinery, and are not specific enough to wind turbine drive-train components.

Objectives

The objectives of the project are to:

- validate the acceptance criteria for the presence of faults/defects in an operational environment
- utilise the acquired trial information in order to optimise the electronics and system packaging
- modify the Graphical User Interface (GUI) in accordance with customer requirements, and
- make the system more adaptable to harsher environmental conditions such as offshore use
- develop a commercial CM system.

Benefits

The developed system will allow for:

- resolving the fundamental industry problems with current CM systems
- meeting the stricter regulations which are to be imposed throughout the EU (which will comply with the amended EN 50308 standard)
- offering a truly specific CM system for wind turbine machinery, to facilitate the emendation of current ISO standards for the diagnosis of wind turbines.

Project partners
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