

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

TWI Ltd
Inesco Ingenieros SL
Brunel University London
Relex Italia Srl
Innora Robotics and Automation SA



www.acmwind.com



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 701002.