

DashWin: Development of an advanced shearography system for the on-site inspection of wind turbine blades

Wind energy has become one of the fastest growing (>20% pa) industries in the world's energy market. This indicates that more wind farms will need to be built in the coming decades, which in turn means an increase in the number of accidents related to mechanical failure of the wind turbine blades (WTB). For existing turbines, the number of mechanical failures is likely to increase rapidly as they age. Therefore, there is a clear market need to develop novel techniques that can meet the requirements of inspecting wind turbine installations so that structural failure and catastrophic consequences can be avoided.

Project objectives

In the DashWin project, a novel non-contact NDT system will be developed. The aims are:

- To develop a novel shearography system able to inspect wind turbine blades on-site without dismantling the blade. This will be the first time that a shearography system is used for inspecting a wind turbine blade in-service at a wind energy installation.
- To integrate the shearography system with a robotics platform to carry out on-site inspections.
- To develop a comprehensive software package for image processing, automatic phase compensation, and result interpretation and information storage.
- To validate the reliability of the new system and associated opto-mechanical set-ups through a field trial test. System assembly and potential manufacturing routes will also be established.
- To develop and validate a new procedure for conducting regular inspection of WTB using the new robotic shearography system.

Application of the DashWin WTB inspection system provides numerous benefits including:

- Consistent automated examination via robot platform.
- Rapid, high-resolution inspection.
- Identification of surface and sub-surface defects (to a depth of up to 50mm).
- Advance warning of manufacturing, service or fatigue defects likely to cause catastrophic structural failure.
- In-situ inspection, with no need to dismantle the WTBs.
- Avoidance of hazardous working at height.



For further information, please visit the project website at www.dashwin.eu

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