

AutoWinSpec - Automated Mechanical Property and Fatigue Life Assessment of Composite Wind Turbine Blades in Less than 4 Hours

Although wind power is the most promising renewable energy source and turbines are by far the most widespread means for harnessing wind energy there are difficulties to overcome especially since their use is to expand. Despite the technological advances and use of composite materials, wind turbine rotor blades continue to fail due to the highly variable loads, significantly reducing the availability of the WT and raising the downtime costs to over 600 million euro annually in EU. Current inspection methods fail to meet the end-user needs; reducing downtime as they focus on detecting defects. In fibre composite materials defects cannot be unambiguously matched with mechanical properties making traditional NDT techniques inadequate.

The AUTOWINSPEC idea is to deploy a NDT system that evaluates the mechanical integrity of WTBs in a rapid and reliable manner. The core technique is Acoustic-Ultrasonic inspection method, which is a mechanical integrity assessment technique, to enable accurate estimation of the mechanical properties of the blades. The overall system includes:

- Two probe holders that apply the AU transducers to the blade
- An autonomous robotic crawler that travels along the WTB when stalled at an horizontal position
- Control software
- Data analysis and display software



Figure 1: The AUTOWINSPEC system

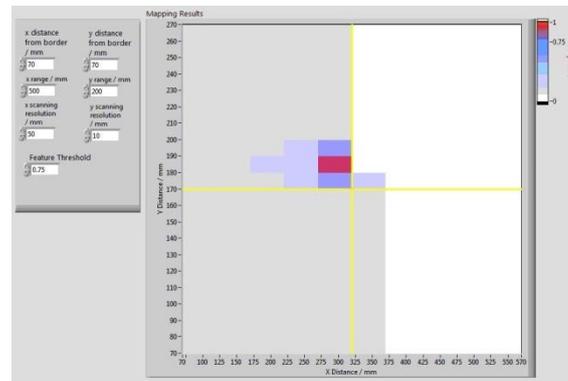


Figure 2: The Example Data Display Interface for AutoWinSpec

The AUTOWINSPEC system aims for a target reduction of 50% in maintenance costs, including the reduction of revenue loss through downtime, reducing them to 15% of overall turbine operating costs.

The product developed through this project will significantly enhance the Operation and Maintenance sector of Wind Power both onshore and offshore by providing an effective solution to the wind turbine blade failure problem.

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

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