



## In-situ wireless monitoring of offshore wind towers and blades

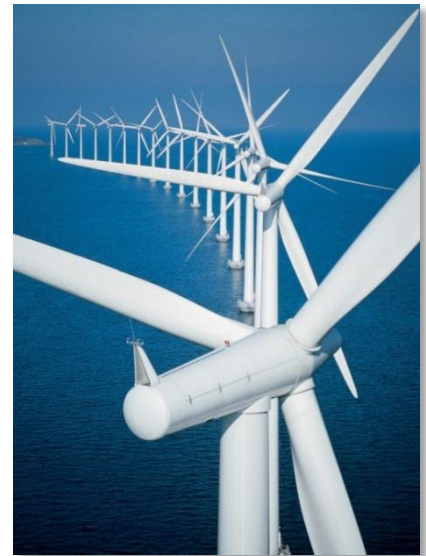
- **Project budget:** £1.8m
- **End Users:** RWEnPower  
TUV NEL  
FUGRO

The project addresses the need to monitor blades and towers for offshore and onshore wind turbines. The composite blades can suffer fatigue failure and towers are susceptible to corrosion and fatigue. Blades and structures require regular inspection to avoid catastrophic failure risk.

Current inspection methods can only be performed offline, through human intervention, with limited volume coverage and are cumbersome, time consuming, hazardous and expensive.

The project will develop novel measurement technology to continuously monitor the structural integrity of offshore and onshore wind tower structures, using embedded inductive displacement sensors (IDS) and long range ultrasonic (LRU) and acoustic emission technique (AE) in combination (LRU/AE). Wireless communications will be used to control the monitoring system and transmit the measurement data to an onshore base.

The system, providing 100% volume coverage, could reduce inspection costs by up to 77% (£1.9bn p.a in the UK by 2020).



### Project Aims

- Develop monitoring techniques for wind turbine **blades**, using **non-contact inductive displacement** sensors.
- Develop a permanently mounted system that will use a combination of **long range ultrasonic** and **acoustic emission** techniques to continuously monitor the structural health of wind turbine **towers**.
- Develop advanced **signal processing** methods for data analysis.
- Develop a **communications system** to transmit the measurement data onshore and control the monitoring system remotely.

### Applications

While the INSIGHT project is initially being developed for monitoring wind turbine structures, the system lends itself to many other applications where structural integrity is of the utmost importance. Some example applications are:

- Renewable energy devices
- Offshore platforms
- Marine power devices
- Power plants

[www.insightproject.co.uk](http://www.insightproject.co.uk)

### TWI Ltd

Granta Park, Gt Abington, Cambridge CB21 6AL

**T:** +44 (0) 1223 899000 **F:** +44 (0) 1223 890952

NDTinfo@twi.co.uk

[www.twi.co.uk](http://www.twi.co.uk)

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