Innovation Challenge 2

Automating inspection of coatings during production of large composite structures

Background

The OWiX initiative is supporting an innovation challenge owner in the offshore wind industry to identify transferable solutions to meet its innovation needs.

Currently wind turbine blades are coated with Polyurethane (PU) paint in the factory. The structures must be inspected for peel testing, pinholes, drips and coverage following application of the coating. Solutions are required to automate and accelerate the process of checking for such defects.

Whilst not limiting the technologies from solution providers, it is expected that solutions would consider innovations from some of the following areas:

- Camera and imaging systems
- Sensor systems
- Autonomous vehicles
- Piping technologies
- Construction and bridges
- Drones
- Crawlers
- Aerospace
- Marine
- Rail
- Chemicals
- Shipping
- Robotics

To meet the desired timescale and risks, it is preferred that the proposed solution, or the key part(s) of the solution, has been demonstrated in an industrial environment. The solution should be in line with health and safety requirements and regulations.

Solution Requirements

Functional Requirements	• *Solutions must be capable of detecting, monitoring and acquiring data concerning the surface condition of a large complex 3-dimensional glass fibre reinforced composite structure* • *Solutions must be deployed within a single flow factory environment and preferably have minimum human intervention* • *Inspection of the coatings must be undertaken with the target structure in-situ and without the need to rotate or move it* • *Some surfaces may be vertical* • *Imaging data must be recorded and available for review after inspection* • *Identification of surface faults may be advantageous*
Technical Characteristics	• *Solution must be able to detect flaws such as pinholes and drips to a size of 0,05mm to 2mm at a resolution of ±0,01mm*

	• *Automated solution must be capable of inspecting a structure greater than 100m in length and greater than 5m in depth/width at its largest cross section.* • *Solution must be able to automatically inspect a structure in under 10m^2/ minute* • *Edge detection may be advantageous*
Deployment Timescale	• *Commercial implementation: by Q3 2018*

Operating Conditions	• *Solutions must be able to be operated safely and reliably in the following conditions:*
	  ○ *Ambient temperature 20 < temp [˚C] < 30˚C*
	  ○ *Humidity 50 < RH [%] < 80*

Market opportunity	• *Improving the tact time for production of a single structure is where the market opportunity lies* • *A successful solution will have the opportunity to sell 4-6 devices globally to the challenge owner. It will also have opportunities in other sectors*
IP and Potential Commercial Route	• *Existing background IP associated with a potential solution will remain with Solution Provider(s). Where any new IP generation is envisaged, it will be subject to the mutual IP agreement of the Solution Provider(s) and Innovation Challenge Owner* • *Any commercial deployment of transferred solution or newly developed solution, through licensing, joint venture, partnership or direct investment, will be subject to the commercial agreement between the Solution Provider(s) and Innovation Challenge Owner* • *Where necessary, a non-disclosure agreement (NDA) may be signed to uphold confidentiality in the engagement between the Solution Provider(s) and Innovation Challenge Owner* • *Innovate UK and KTN do not take any share of IP ownership or enter into commercial venture through the OWiX programme*