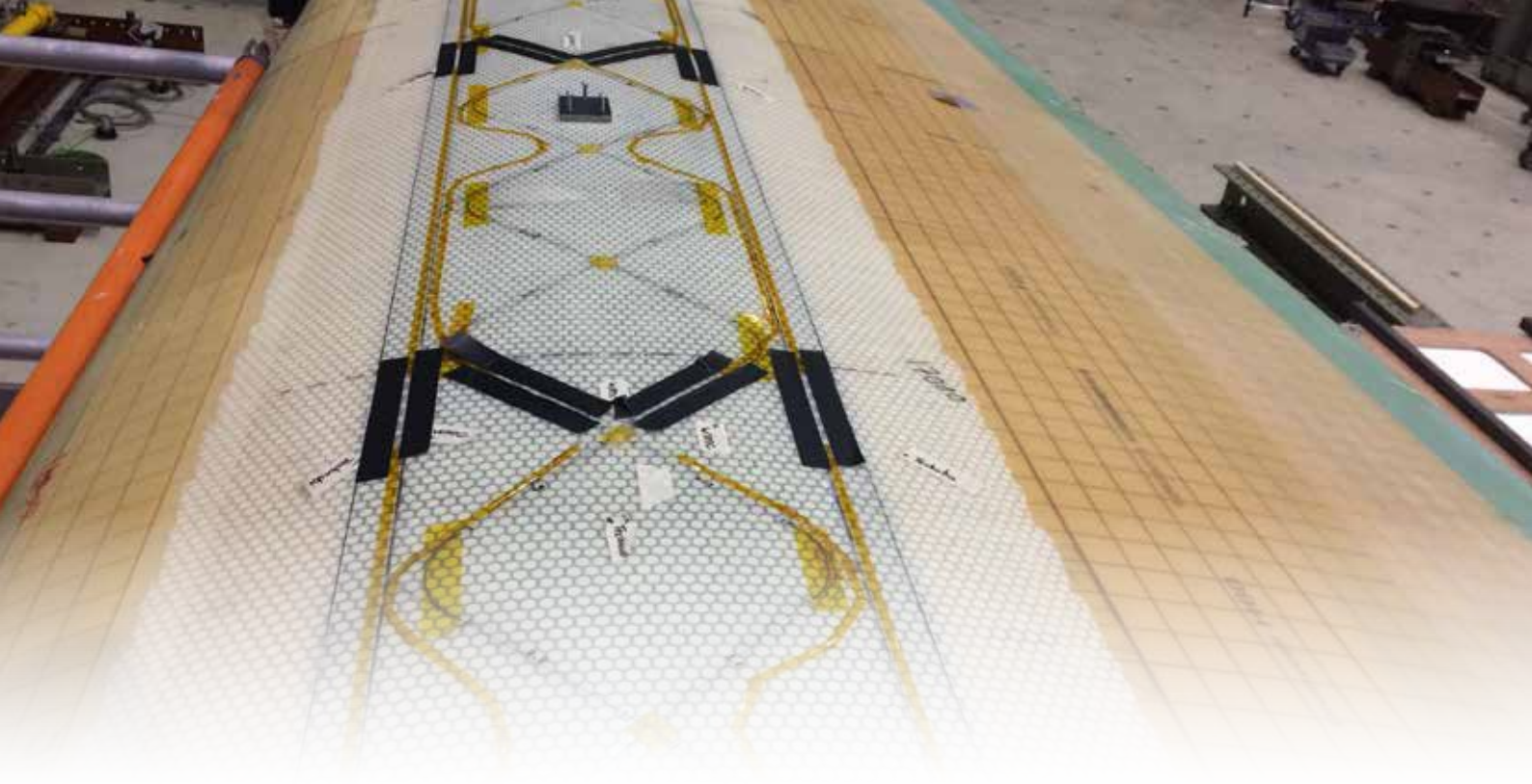

WIND TURBINE BLADE MONITORING

Developments in offshore wind are driven by an increasing size of the wind turbine power per unit. As a consequence the turbine blades become larger and more flexible. Designing these blades, current tools have insufficient accuracy showing up to 17% variations in stiffness.

Ideal in harsh outdoor environments such as offshore wind is the use of light weight fibre optic sensing technologies. The ease of handling, high speed accurate data acquisition, small footprint, low price and minimum impact from the sensors on the material surface (aerodynamics) makes fibre optic sensing superior to the use of conventional strain gauges or for example visual monitoring using cameras.

The ***SwitchedGator*** can log up to 120 optical Fibre Bragg Grating sensors divided over 15 channels using an optical switch allowing for channel multiplexing over different fibres with a sampling rate of >19 kHz per channel and a measurement frequency over 15 channels of up to 70 Hz.

A feasibility study is performed modelling the wind turbine blade and the desired accuracy to determine to optimum amount and placement of the optical sensors. Extrapolating the modelling results onto a real-life blade test proved that optical point-sensing accurately records the in-plane, out-of-plane and torsional deformations in a wind turbine blade. Therefore the ***SwitchedGator*** and optical measurement system are prepared for actual installation on a wind turbine starting a field-test in a wind farm!

Industrial SwitchedRefGator

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