Advances in Monitoring and Assessing Structural Integrity

Thursday 4th May 2017

The Technology & Innovation Centre, University of Strathclyde

10:00  Registration and Refreshments

10:30  Welcome from the Department of Mechanical and Aerospace Engineering
       Professor Andrew Heyes, Head of Department

SECTION ONE:
Maintenance and reliable monitoring for wind turbines through vibration-based structural health monitoring (VSHM) methodologies.

10:50  Challenges of Structural Health Monitoring for Industrial Implementation
       Gurvinder Jagdev, Researcher at Scottish Power Renewables, Glasgow

       The Offshore Wind industry has to confront challenges to reduce risks and costs whilst improving the reliability of foundation structures and wind turbines. Structural health monitoring, condition monitoring and maintenance is essential to address these needs.

11:20  Recent Advances in Vibration-based Structural Health Monitoring for Wind Turbines
       Dr Dmitri Tcherniak, Research Engineer, Innovation Group, Brüel & Kjær S/V, Denmark

       An introduction to two recently developed VSHM techniques. The first, based on mechanical actuators and an array of sensors, employs semi-supervised machine learning. This technique is able to detect even small (15-20 cm) structural defects. The second detects larger amounts of damage with an advanced signal processing method, using a sensor located in the nacelle to detect rotor anisotropy, a typical consequence of blade failure.

11:50  Monitoring and Self-assessment Methods for Composite Laminated Structures
       Dr David Garcia Cava, Teaching Associate, Department of Mechanical and Aerospace Engineering

       The presentation will showcase expertise from the Department Mechanical and Aerospace Engineering in data-driven structural health monitoring methodologies for composite laminated structures and advanced multifunctional materials with self-sensing and self-monitoring capabilities.

12:20  Lunch
SECTION TWO:
Advances in pass-fail criteria by improved structural integrity and material response assessment.

13:20 Advances in Structural Integrity Assessment of Structures Subjected to Cyclic Load Scenarios by Direct Methods
Dr Daniele Barbera, Research Assistant, Department of Mechanical and Aerospace Engineering
Advances in structure and material modelling based on new numerical procedures, including direct methods has proven effective and flexible in solving numerous challenges the power industry tackles to extend the life of components. Understanding the structural behaviour is crucial for efficient and reliable use of health monitoring systems and the data obtained for damage characterization.

14:50 Introduction & Overview of The Advanced Materials Research Laboratory (AMRL)
Dr Tiziana Marrocco, Knowledge Exchange Manager, AMRL
Find out about the facilities available at the AMRL (materials characterisation and analysis, mechanical testing, geomaterials and bioengineering laboratories). A selection of case studies that showcase our capabilities and experience of working with external partners will be presented. Find out how you can access the facilities. A visit to the AMRL will follow.

14:20 Discussion and Close
Recap of the event and an opportunity to start discussions about future collaborations. Refreshments available.

14:50 Transition from TIC Building to AMRL

15:00 Tour in the AMRL facilities
James Weir Building, 75 Montrose Street Glasgow, G1 1XJ.