PROJECT

DIMES

Development of Integrated Measurement Systems

Funding: European (Horizon 2020)

Duration: Jan 2019 - Mar 2021

Status: Complete

Total project cost: €1,320,261

EU contribution: €1,199,901

Call for proposal: H2020-CS2-CFP07-2017-02

CORDIS RCN : 218805

Objectives:

The aim of the project is to develop advanced integrated testing methods that have the capability to detect a crack or delamination in a metallic or composite structure and have the potential to be deployed as part of an on-board structural health monitoring system for passenger aircraft. The proposal incorporates a new philosophy for monitoring damage in which the disturbance to the strain field in the structure caused by the damage is used to identify significant damage and to track its propagation. Recently, this approach has been demonstrated to be at least as effective in composite structures as traditional non-destructive evaluation techniques and, in CS2 project INSTRUCTIVE using infrared technology, it has been shown to be capable of identifying smaller cracks in metallic structures than any other available technique.

Methodology:

In this project, it is proposed to amalgamate these innovations with more established techniques, such as strain gauges and acoustic emission, and to demonstrate an integrated testing method. The objectives are designed to mature technologies from TRL 4 to 6 that are likely to have a disruptive impact on the structural health monitoring of next generation large passenger aircraft. The objectives are:

- to develop a robust and innovative concept for integrating a diverse set of sensors and data acquisition systems for detecting and monitoring damage in an aircraft assembly;
- to produce an integrated system of sensors and data acquisition systems deployed on a test bench representing a centre fuselage section with integrated cabin and system elements, and;
- to conduct prototype demonstration and evaluation tests of the integrated system and test bench using independent systems.

The primary outcome will be the demonstration, on a test bench consisting of a fuselage centre section, of an integrated measurement system for ‘on-line’ detecting and monitoring damage based on a diverse range of sensor systems.

Parent Programmes:

H2020-EU.3.4. - Horizon 2020: Smart, Green and Integrated Transport

Institute type: Public institution

Institute name: European Commission

Funding type: Public (EU)

Other programmes: JTI-CS2-2017-CfP07-AIR-02-56 Advanced Integrated Testing Methods development

Lead Organisation:

The University Of Liverpool

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Brownlow Hill 765 Foundation Building
Liverpool
L69 7ZX
United Kingdom

Organisation Website:
http://www.liv.ac.uk

EU Contribution: €505,936

Partner Organisations:

Strain Solutions Limited

Address:
DUNSTON ROAD DUNSTON INNOVATION
CHESTERFIELD
S41 8NG
United Kingdom

EU Contribution: €79,765

Dantec Dynamics Gmbh

Address:
KAESSBOHRERSTRASSE 18
89077 Ulm
Germany

Organisation Website:
http://www.dantecdynamics.com

EU Contribution: €201,075

Eidgenoessische Materialpruefungs- Und Forschungsanstalt

Address:
Ueberlandstrasse 129
8600 DUEBENDORF
Switzerland

Organisation Website:
http://www.empa.ch

EU Contribution: €413,125

Technologies:

Condition monitoring
Structural health monitoring based on modelling

Development phase: Demonstration/prototyping/Pilot Production

STRIA Roadmaps: Vehicle design and manufacturing, Infrastructure

Transport mode: Air transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Safety/Security

Geo-spatial type: Other