

ALAMSA

A Life-cycle Autonomous Modular System for Aircraft Material State Evaluation and Restoring System

This Framework 7 project brings together experts from across Europe to develop nonlinear imaging techniques and self-monitoring solutions using an innovative class of non-destructive techniques known as Nonlinear Elastic Wave Spectroscopy (NEWS) methods.

These will be developed to diagnose manufacturing defects such as porosity, component assembly contact conditions and incipient damage in the form of microcracks, delamination, clapping areas, adhesive bond weakening, thermal and chemical damage. This should offer higher sensitivity and enable imaging of internal areas of aeronautic components that are not accessible by conventional methods.

The project also aims to develop self-healing composite materials for aircraft structures, which have a built-in capability to restore mechanical properties several times through multiple cycles of healing upon thermal activation, allowing multiple damage occurring at the same location to be “repaired”. Linking novel automatic self-monitoring systems to these smart in-situ “self-repair” mechanisms will allow a continuously monitored and restored material integrity. The automated self-monitoring built-in system will have a multi-level role. It will act as a “trigger mechanism” allowing the discrimination of defects and material failure in a timely manner and be smart enough to compute the degree of malfunction and to assess autonomously in an active and remote mode whether aircraft structures need the intervention of a “self-healing recovery program” for rapid repair and redeployment.

Increasing the efficiency of aircraft maintenance operations, extending the damage tolerance boundaries of materials, reducing materials usage and extending the service life of operating structures should help achieve the challenging environmental targets of the Advisory Council for Aeronautical Research in Europe (ACARE).

The project commenced on 1st November 2012 and runs for four years.



ALAMSA

A Life-cycle **A**utonomous **M**odular **S**ystem for Aircraft Material State Evaluation and Restoring System

There are nine partner organisations in this consortium.



University of Bath, Bath, UK



Délégation CNRS Nord Pas de Calais / IEMN, Lille, France



Israel Aerospace Industries, Tel Aviv, Israel



University of Stuttgart, Stuttgart, Germany



Katholieke Universiteit Leuven, Leuven, Belgium



DAKEL, Prague, Czech Republic



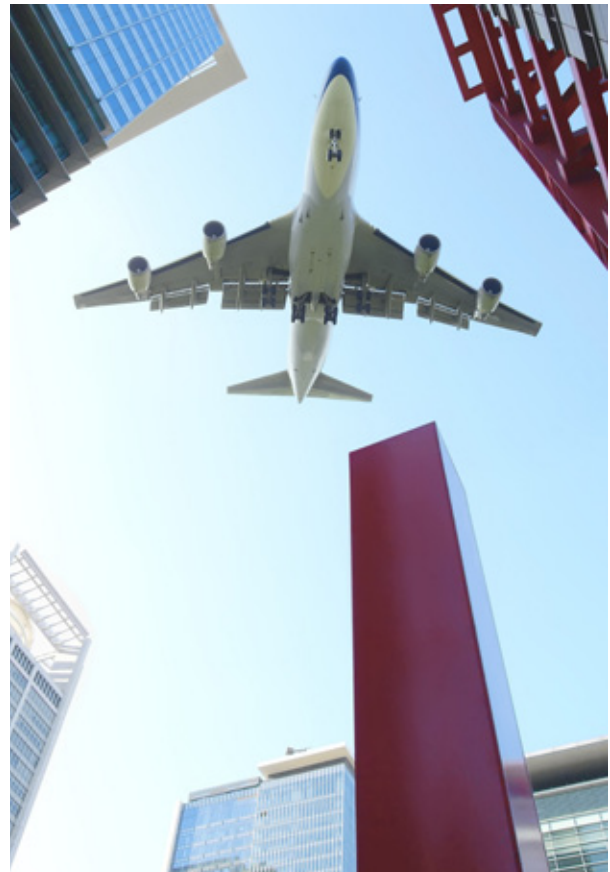
IMCB-CNR, Naples, Italy



EDEVIS GMBH, Stuttgart, Germany



Delft University of Technology, Delft, The Netherlands



Visit our website for news items and contact details of all the partner organisations:
go.bath.ac.uk/alamsa

For enquiries please contact:

Dr Michele Meo, Lead Academic
Department of Mechanical Engineering
University of Bath, Bath, BA2 7AY, UK
Email: m.meo@bath.ac.uk
Phone: +44 (0)1225 384224

Dr Denise Cooke, Project Manager
Research Development and Support Office
University of Bath, Bath, BA2 7AY, UK
Email: d.cooke@bath.ac.uk
Phone: +44 (0)1225 383622