PROJECT

FluidER

Real time Optoelectronic Sensors for Electro-Actuator Hydraulic Fluid Contamination Monitoring

Funding: European (Horizon 2020)

Duration: Apr 2019 - Mar 2021

Status: Complete

Total project cost: €560,983

EU contribution: €498,451

Call for proposal: H2020-CS2-CFP08-2018-01

CORDIS RCN : 221235

Objectives:

FluidER project aims to deliver fully integrated and autonomous sensor for in-line sensing and diagnosis of aviation hydraulic fluids (HF) used in electro Hydraulic Actuators (EHA). The proposed diagnosis approach is based on the combination of hydraulic fluid physic-chemic parameter sensors and fluid contamination sensors and, with the aim of achieving an early warning of degradation signs, especially in terms of particulate count and water contamination, before the hydraulic fluids exceeds the service limits.

The combination of a set of heterogeneous sensor technologies is motivated by the lack of accuracy achieved by single devices, especially when dealing with multi-source contaminations and when an early identification of degradation evidences is targeted. FluidER proposal merges two types of approaches: (i) Sensors delivering measurements of physical and chemical parameters of the Hydraulic Fluid as the Viscosity, Density, Moisture, Dielectric Constant, Colour or Temperature, and (ii) sensors specifically designed to moeitarize different contamination sources as the particulate matter concentration, presence of air or water.

Specifically, FluidER will address the analysis of physical contaminants (metallic and non-metallic particulate count, air bubbles, etc.) through in-line microscopic imaging and machine vision proprietary techniques. Additionally, chemical contaminants (water content, acidity) will be estimated through VIS-IR spectroscopic inspection and chemometric algorithms.

The information obtained from the different sensors will be used to generate a Diagnosis of the status of both, the fluid itself and the EHA equipment, through new health monitoring algorithms.

The different hardware and software components included in the FluidER solution will be gradually tested in different test beds, ranging from controlled laboratory hydraulic test beds to a complete EHA test bed and different standardized aircraft tests.

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-CS2-2018-CfP08-SYS-02-49 Health Monitoring for Electro-Hydraulic Actuator fluid

Lead Organisation:

Fundacion Tekniker

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Organisation Website:
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EU Contribution: €352,545

Partner Organisations:

Element Material Technology Seville Sl

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EU Contribution: €145,906

Technologies:

Condition monitoring
Sensor condition monitoring system

Development phase: Validation

STRIA Roadmaps: Vehicle design and manufacturing, Infrastructure

Transport mode: Air transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Other specified

Geo-spatial type: Other