PROJECT

BrEATHE

high capacity planet BEAring Technology for High Efficiency gearbox

Funding: European (Horizon 2020)

Duration: Jan 2019 - Apr 2022

Status: Ongoing

Total project cost: €998,918

EU contribution: €998,918

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

CORDIS RCN : 220280

Background & policy context:

The Ultra High By-pass Ratio (UHBR) engine provides environmental benefits through a high-power gearbox decoupling fan and turbine speeds. To implement such engine different technological issues, raise: the increase of the

1. rotational speed,
2. harsh lubrication conditions and
3. power density.

The design of the rolling bearing, crucial component, can affect the gearbox and engine efficiency, performance and reliability.

Objectives:

The aim of BrEATHE is to develop, design, model and test a rolling bearing to be mounted in a high power gearbox, including investigation for new high loaded materials, development of models to predicts bearing behaviour, producing samples and test them in dedicated test bench.

Specific project objectives are:

- To define the geometry and perform the design of the bearing. To predict heat generation and transfer in the planet bearing through interactions between dynamic and thermal behaviours.
- To demonstrate a -30% in power loss & oil flow and a 15% increase in rolling contact stress capability in comparison to the current baseline solutions and without any detrimental effect on reliability.
- To assess the benefits of different process technologies and materials in reaching the efficiency and stress capability required by the gearbox and engine architecture. Including design optimization, comparison of different case-hardened steel grade coupled with ceramic rolling elements.
- To produce a sufficient number of bearings to sustain the test plan based on a dedicated test bench.

To demonstrate their enhanced performances, the BrEATHE new bearing technologies will firstly assessed through modelling and then testes in full-scale testing, with full duty cycle representing the real flight spectrum. The gained theoretical knowledge will enable the transfer and exploitation of projects results to the industrial field by providing analysis tools and new design rules.

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-ENG-01-25 Gearbox bearing design & testing

Lead Organisation:

Skf Aerospace France

Address:
Avenue Marc Seguin 1
26240 Saint Vallier
France

Organisation Website:
http://www.skf-aerospace.com

EU Contribution: €378,451

Partner Organisations:

Skf Aeroengine France

Address:
34 AV DES TROIS PEUPLES
78180 MONTIGNY LE BRETONNEUX
France

Organisation Website:
http://www.skf-aerospace.fr/en/

EU Contribution: €620,468

Technologies:

Road vehicle design and manufacturing
Novel gearbox concepts

Development phase: Validation

STRIA Roadmaps: Vehicle design and manufacturing

Transport mode: Road transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Other specified

Geo-spatial type: Other