DevTMF

Project ID: 686600
Funded under: H2020-EU.3.4.5.5.

Development of Experimental Techniques and Predictive Tools to Characterise Thermo-Mechanical Fatigue Behaviour and Damage Mechanisms

From 2016-02-01 to 2020-01-31, ongoing project

Project details

<table>
<thead>
<tr>
<th>Total cost:</th>
<th>Topic(s):</th>
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<tbody>
<tr>
<td>EUR 994 538,75</td>
<td>JTI-CS2-2014-CFP01-ENG-03-01 - Characterisation of Thermo-mechanical Fatigue Behaviour</td>
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<th>EU contribution:</th>
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<td>EUR 994 538,75</td>
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<th>Coordinated in:</th>
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<td>Sweden</td>
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<tr>
<th>Funding scheme:</th>
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<tr>
<td>CS2-RIA - Research and Innovation action</td>
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Objective

DevTMF takes the collective technical expertise and experience of working on thermo-mechanical fatigue (TMF) problems related to large aero-engines from three major centres of TMF research, namely Linköping, Swansea and Nottingham Universities in order to perform the activities of this topic. Together, the team will deliver significant technical innovations in following major topics to ensure world-leading competencies in aero engine and aircraft manufacturing sector for Europe:

1. Improvement and development of advanced standard and non-standard cutting-edge TMF experimental methods and harmonisation of the test methods to enable standardisation across the field by performing comprehensive studies into the phenomena for a range of representative parts,
2. Advanced metallurgical assessment of structural disc alloy(s) taking into account the effect of multiple critical variables (e.g. R-ratio, phase, environment, dwell) to determine active damage mechanisms that control the life under TMF operating conditions, and
3. Physically based coupled models, with experimental validation, capable of predicting TMF initiation and propagation lives of components subjected to complex engine cycles and suitable for implementation in the computer programmes used to predict component lives.

The project will take the above-described technologies to TRL5. Two business opportunities are addressed by this work: (i) at the end of the project the materials understanding and lifing models will be used to optimise/uprate the performance of existing individual aero engine components and (ii) over a longer timescale influence the development of new disc alloys and ultra efficient future designs (Advance, Ultrafan). The developed TMF technologies will enable industrial aero gas turbines used for aero engines to be operated at higher temperatures and pressures, improving their efficiency and reducing fuel consumption (by 1%) and CO2 emissions. Hence improved competitiveness and marker share.

Related information

<table>
<thead>
<tr>
<th>Report Summaries</th>
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<tbody>
<tr>
<td>Periodic Reporting for period 1 - DevTMF (Development of Experimental Techniques and Predictive Tools to Characterise Thermo-Mechanical Fatigue Behaviour and Damage Mechanisms)</td>
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</tbody>
</table>
Coordinator

LINKOPINGS UNIVERSITET
CAMPUS VALLA
581 83 LINKOPING
Sweden

EU contribution: EUR 343 873,75

Activity type: Higher or Secondary Education Establishments

Contact the organisation

Participants

SWANSEA UNIVERSITY
SINGLETON PARK
SA2 8PP SWANSEA
United Kingdom

EU contribution: EUR 457 735

Activity type: Higher or Secondary Education Establishments

Contact the organisation

THE UNIVERSITY OF NOTTINGHAM
University Park
NG7 2RD NOTTINGHAM
United Kingdom

EU contribution: EUR 192 930

Activity type: Higher or Secondary Education Establishments

Contact the organisation

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