

PROJECT

HEIAIrcOPT

Helicopter Engine Air Intake OPTimization Tool

Funding: European (Horizon 2020)

Duration: Jan 2016 - Jul 2018

Status: Complete

Total project cost: €529,806

EU contribution: €370,860



Call for proposal: H2020-CS2-CFP01-2014-01

[CORDIS RCN : 199611](#)

Objectives:

The objective of this topic is to set up an industrial and fully automatic optimal design tool, integrating software identified by the Topic Leader, in order to reach TRL6 at the end of the project. This tool has to be dedicated to rotorcraft engine air intake analysis and able to handle multi-objective, multi-parameters and multi-points optimization on a given CATIA CAD.

An effective aerodynamic design of the engine air intakes is essential for ensuring a proper air supply to the first stage compressor and thus an efficient behaviour of the whole engine installation. However, its optimization has to deal with a lot of requirements and constraints, not always linked to the engine performance itself, but often aiming at improving conflicting criterions. For instance, the engine air intakes design will have some impact as regards the three following different issues:

- Volume specifications
- Helicopter manufacturer specifications, along with the airframe performance level required
- Engine manufacturer specifications, along with the engine performance level required

Methodology:

In order to achieve the task, optimization will take into account 3 flight conditions. Among all optimization strategy available, due to CFD solver limited capabilities for adjoint computations, a Surrogate Based Optimization approach is proposed. It allows use of gradient free and global optimization method.

Two optimizations are planned during the task: one without Inlet Barrier Filter and a last without. The final objective is to improve flow solution at Air Intake Plane from a distortion and pressure losses aspect.

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)

Lead Organisation:

Altran Technologies

Address:

Boulevard Gouvion St Cyr 58
75017 Paris
France

EU Contribution: €370,860

Technologies:

Computer-aided design and engineering
CFD tools for rotary wing aircraft

Development phase: Demonstration/prototyping/Pilot Production

STRIA Roadmaps: Vehicle design and manufacturing

Transport mode: Air transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Digitalisation

Geo-spatial type: Other