Case Study: Designing the MONARCH 5 Turboprop Engine

Summary

Client: UAV Turbines

Need: An advanced software tool for turbomachinery (compressor and turbine) design and cycle analysis for application in UAV microturbine technology.

Solution: AxSTREAM for custom design of a high-speed (100,000+ RPM) microturbine engine.

Product Requirements:

Highly reliable with ability to operate for 2,000+ hours between maintenance intervals.

Simple to operate on heavy fuels of varying quality (jet and diesel).

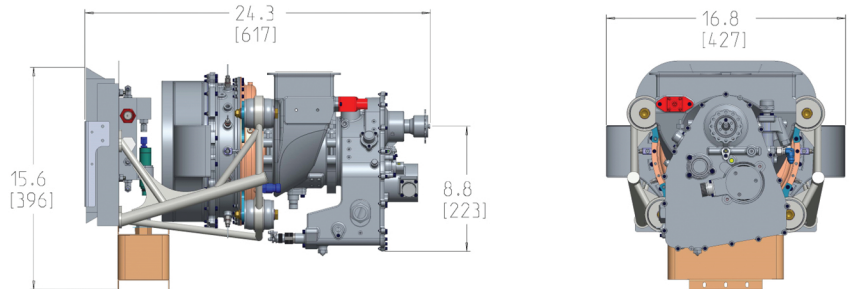Low fuel consumption regardless of full or part power.

Low operational noise and vibration for quieter flight and improved image quality.
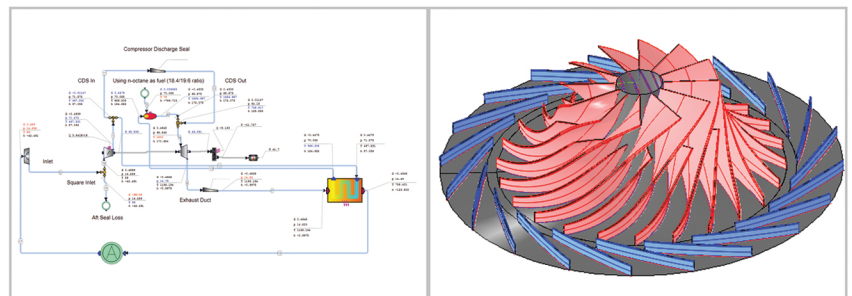
Results:

The Monarch 5 turboprop system flew for the first time at Griffiss Airport in Rome, New York. The Monarch 5 powered a TigerShark aircraft produced by Navmar Applied Sciences Corporation. The aircraft flew much quieter and smoother with the Monarch 5 when compared with other internal combustion engine systems on the market.

AxSTREAM Used in Turboprop Propulsion System Design

The phrase "good things come in small packages" rings very true when it comes to UAV Turbines. Through the development of its Monarch 5 turboprop engine, the company is bringing a new era of high-performance turboprop engines to the UAV market.

SoftInWay provides UAV Turbines with its integrated and automated turbomachinery design platform, AxSTREAM. UAV Turbines uses AxSTREAM as its software of choice for the development of its microturbine technology including the compressor and turbine components. The company utilizes modules for preliminary design, meanline and streamline analysis, performance mapping, profiling and 3D blade design, FEA, and CFD analysis. UAV Turbines also uses AxCYCLE to simulate and analyze its engine cycle performance.

"True innovation fundamentally depends on the strength of your engineering team and the tools at their disposal. Luckily with a combination of the brilliant minds at UAV Turbines and AxSTREAM, we have both", said Kirk Warshaw, UAV Turbine's CEO. "It has been an absolute pleasure working with SoftInWay's engineering team and we're excited for future collaborations."