Arrano, the latest Turbomeca (Safran) engine, was selected as the exclusive engine for the future H160 by Airbus Helicopters. This new-generation turboshaft combines technological innovation, robustness and performance.

At the last International Heli-Expo show, Airbus Helicopters unveiled the H160, due to replace the Dauphin from 2018. Previously known by the code name "X4" it will be the first helicopter to be powered by the Arrano, the new engine with 1,100-1,300 shaft horsepower developed and manufactured by Turbomeca. "In 2012, Airbus Helicopters selected two engine manufacturers for this model", commented Patrick Moncoutié, the Arrano program manager at Turbomeca. "But in late 2014, the company revised its specifications and asked for 10% extra power for operating in hot weather conditions. Technical and commercial discussions led to the choice of the Arrano as sole engine on this helicopter. This decision to go from two engine manufacturers to one is extremely rare in the aerospace industry and speaks highly for the qualities of our engine and the trust Airbus Helicopters places in us."

Mature innovations

The Arrano program is of strategic importance for Turbomeca. "There was strong demand for engines with horsepower levels between that of the Arriel and the Ardiden" explains Patrick Moncoutié. "This market incited us to launch this new range for 4 to 6 ton twin-engine helicopters or 2 to 3 ton single-engine helicopters."

Designed with the goal of reducing fuel consumption by 10 to 15% compared to previous generations, the Arrano incorporates many technical innovations validated by the Tech 800* demonstrator. "We only selected technologies that were mature when launching the Arrano" stated Patrick Moncoutié. "We must be able to deliver an engine that is reliable and powerful when it enters service."

To optimize the performance of its engine, Turbomeca introduced a particular feature: an IGV (Inlet Guide Vanes) system made up of small variable-pitch blades positioned above the compressor. The purpose was to
improve the thermodynamic cycle of the engine in cruise flight. "It's one of the innovations that contribute to the reduction of fuel consumption", points out Patrick Moncoutié. "This is a key factor for our customers because it increases the range while reducing operating costs and the environmental footprint."

New manufacturing methods will also be used for the production of the Arrano, such as additive manufacturing using laser fusion on a metal powder bed. The combustion chamber injectors will be manufactured by this process to obtain a one-piece, complex-shaped part in record time.

Thomas Garza / Safran

Optimized maintenance

"The Arrano has also been designed to reduce maintenance costs", adds Patrick Moncoutié. "Depending on the mission, this engine can fly almost 5,000 hours before needing a general overhaul. We have also worked hard to reduce the number of periodic inspections required by the operator. This represents a significant saving of time and availability for our customers."

Engine tests started a year ago, with a view to preparing for the H160's first flight, planned for late 2015. They will continue until 2017, with certification and endurance tests due to demonstrate the engine's maturity before the new helicopter enters into service in 2018.

The Arrano's technical characteristics and cost-competitiveness, along with the momentum generated by being selected as the exclusive engine for the H160 could encourage other potential customers to formalize their interest in this engine.

* The Tech 800 demonstrator is the result of the collaboration of 34 partners from ten European countries. The technologies validated by this demonstrator are designed to reduce emissions, in accordance with the objectives set by the European Clean Sky program. This demonstrator ran on a test bench for the first time in April 2013.

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