Arrano: the cutting-edge engine for helicopters

Arrano, Safran Helicopter Engines’ latest model, has been selected to power Airbus Helicopters’ future H160, and made its maiden flight on January 27, 2016. This next-generation turbine was in the spotlight on Safran’s stand at the Paris Air Show. It is packed with the latest technology, robust, and taking performance to the next level. It is scheduled to enter into service in 2019. We spoke with Cyrille Ressejac-Duparc, who runs the Arrano program.

Where does Arrano fit into Safran Helicopter Engines' range?

The Arrano family is in the 1,100 to 1,300 shaft power (shp) range and is designed to power medium-weight (four- to six-ton) twin-engine helicopters such as the H160, or two- to three-ton single-turbine helicopters.

In the Safran Helicopter Engines family, it sits between Arriel, which is mainly for light-duty aircraft, and Ardiden, which we build for “super-medium” class helicopters. Arrano is in a relatively new power-rating category, as the helicopters that airframers are putting on the market are slightly heavier than before (think of the 6-ton H160, which will replace the 4-ton Dauphin, for example).

What are the main advantages of this new turboshaft engine?

More than anything else, Arrano is an unsurpassed combination of new-generation technologies and mature technologies. So it’s efficient, robust and dependable, and its operating and maintenance costs are significantly lower. We kept its architecture as simple as possible; and at the same time optimized its performance, with a two-stage centrifugal compressor, a high-pressure turbine and a free single-stage turbine.

We also designed Arrano to simplify maintenance. It will need five times fewer maintenance operations than today’s engines. It will also be a 100% connected engine packed with the best health monitoring, automatic fault diagnosis and predictive maintenance technology out there today. And, lastly, it will also be fully compatible with BOOST, our engine operation supervision service.

Why did Airbus Helicopters choose it?

Airbus Helicopters wanted to power its H160 with breakthrough technology bringing about a step change in performance, without compromising reliability, robustness and costs. Another thing they looked at was H160 scalability: they want to be able to step up the engine’s power when they introduce new models further down the road.
How does Arrano tie in with the European Clean Sky program?

This turbine is a "descendant" of the European Clean Sky research program, which Safran worked on. We engineered it to reduce fuel consumption by 10 to 15% compared to previous generations. We have embedded several technical breakthroughs we cleared using the Tech 800 demonstrator we have been developing since 2013 on the Clean Sky program.

The Arrano certification campaign is rolling out: where is it at right now?

Helicopter engine certification campaigns encompass a number of significant tests. The simulated altitude tests, for example, took place last year at the DGA’s (French defense procurement agency’s) engine test center in Saclay. We’ve completed the blade shedding tests (to check mechanical protection against engine overspeed) and the tests to check engine operation if the oil supply stops. This year, we moved on to testing endurance, especially in adverse operating conditions. Since its first flight in January 2016, the engine has spent over 4,000 hours in tests (on no fewer than 25 engines), including 700 hours in the air.

In the first half of this year, Safran Helicopter Engines delivered the first pre-production engines to Airbus. We will be delivering the first production engines in 2018, on schedule.

Learn more
- Arrano at full power
- The Group's helicopter engines