The E-Fan, towards an increasingly electric aircraft

On June 17, 2015, the all-electric aircraft E-Fan made its 99th flight at the Paris Air Show. In this interview, Christophe Claïsse from Safran's Innovation Department explains the program's ambitions and Safran's involvement.

Can you remind us what the E-Fan is?

The E-Fan is a fully electric aircraft. The first prototype, the E-Fan 1.0, was made by Airbus Group and Aéro Composite Saintonge (ACS), a French SME specialized in composite materials; this is the model flying at the Paris Air Show today.

The E-Fan is now being developed by eleven partners gathered in a consortium, including Safran, Zodiac Aerospace, the CEA*, Serma Technologies, Evtronic, the engineering school of Arts & Métiers ParisTech, as well as ISAE and ENAC**.

The E-Fan is designed for flying clubs and flight schools, where it can be used to train professional pilots. It has a flight time of one hour, and its batteries can be recharged in less than 45 minutes, which will enable it to fit in about five flights a day.

It is the E-Fan 2.0, developed by the consortium in partnership with the aircraft manufacturer Daher, that will be industrialized. Production will take place in Pau, in a dedicated facility.

A version 4.0 is also being considered: a four-seater that will be equipped with an electric "range extender"**** enabling it to reach more than three hours of flight time.

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What is Safran's role in the development of the E-Fan?

The E-Fan 2.0 is currently in the pre-project study phase. A scale model of this future two-seater is on display at the Paris Air Show on the stand of Airbus Group Innovations (the Airbus Group's worldwide research network) and a model of its propulsion system, developed by Safran, can be seen on our stand (Hall 2A, 228-252).

Three group companies, Snecma, Labinal Power Systems and Aircelle, have teamed up to develop the propulsion system, based on an electric integrated propulsion system (eIPS) comprising the electric motor, control electronics, the fan and the nacelle. The E-Fan's two electric motors have a combined power of 60 kW provided by lithium-ion polymer 270 V batteries located in the wings. They actuate ducted propellers, which reduces noise and increases safety.

What does the development of this aircraft represent for Safran and its partners?

The E-Fan is a concrete opportunity for us to work with Airbus Group Innovations in its research on the more electric aircraft and acquire our very first experience in the certification of an aircraft using an electrical propulsion system. It's also a way for Safran to gather feedback from users – from when the E-Fan enters into service. The technologies we are developing for this project will serve as a foundation to progressively adapt various electrical systems to increasingly larger aircraft, and thus contribute to the development of the more electric aircraft.

The electrification of aircraft is one the major challenges in aviation: it makes aircraft lighter and it simplifies the operation of their equipment, all the while reducing CO₂ emissions and noise.

Safran's involvement in the E-Fan program is in keeping with the Group's innovation strategy, as the Group is constantly developing new systems to produce new forms of mobility that are safer and more environmentally friendly.
* Commissariat à l’Energie Atomique et aux énergies alternatives (Alternative Energies and Atomic Energy Commission)
** Respectively the Institut Supérieur de l’Aéronautique et de l’Espace (Higher Institute of Aeronautics and Space) and the Ecole Nationale de l’Aviation Civile (National Civil Aviation School).
*** Auxiliary power to extend the range of an electric vehicle

Learn more:

- The more electric aircraft showcased on the Safran stand (article)
- "We make it more electric!" Safran's activities in the field of the more electric aircraft (video)
- We are all fans of the E-Fan! (video - flight demo)