

A graphic consisting of a blue L-shaped bracket on the left side, followed by the words 'PRESS RELEASE' in a bold, blue, sans-serif font.

Turbotech and Safran test first hydrogen turboprop for light aircraft

Vernon, January 29, 2024

- Turbotech and Safran have successfully tested the first hydrogen-fueled gas turbine engine for the light aviation market.
- The tests at ArianeGroup's facility in Vernon, France, are part of the BeautHyFuel project to explore hydrogen propulsion solutions for light airplanes. BeautHyFuel is supported by the French Civil Aviation Authority (DGAC) as part of France's post-Covid stimulus program and is led by Turbotech and Elixir Aviation in partnership with Safran, Air Liquide and Daher.
- The project leverages ArianeGroup's decades-long experience with hydrogen propulsion for the Ariane rocket.

On January 11, Turbotech and Safran successfully completed the first test of a hydrogen-fueled aero gas turbine engine with ultra-high performance regenerative cycle. The test was made possible by ArianeGroup's resources and decades of expertise in preparing and performing tests with hydrogen fuels for space applications at its Vernon test facility in France.

This initial trial was carried out using hydrogen fuel stored in gaseous form. In a second phase later this year, the engine will be coupled to a cryogenic liquid storage system developed by Air Liquide to demonstrate the end-to-end integration of a propulsion system replicating all functions on a complete aircraft.

"This first experiment carried out using a Turbotech TP-R90 regenerative turboprop engine shows we can convert previously proven internal combustion technologies to create a working zero-carbon solution for general aviation," said Damien Fauvet, CEO of Turbotech. "As we move to liquid hydrogen fuel, the aim is to offer a high energy-density propulsion system with real commercial applications. Our solution will be readily retrofittable on light airplanes and could have potential in other market segments."

"This first stage of the project has already gone beyond our expectations," said Pierre-Alain Lambert, VP Hydrogen Programs for Safran. "Our objective was to validate the behavior of the engine and fuel control system at all phases, from engine start to full throttle, as well as strategies in the event of a failure. For Safran, this kind of small-scale investigation is really valuable, because we can learn quickly and nimbly. It complements our other, larger-scale initiatives aimed at removing the barriers to hydrogen propulsion for air transport, such as our technology demonstration in partnership with CFM International¹ as part of Airbus's ZEROe program, supported by Clean Aviation. ArianeGroup's expertise in hydrogen testing was decisive in the timely success of this crucial first step."

¹ CFM International is a 50/50 joint venture between Safran Aircraft Engines and GE Aerospace.

Turbotech, Elixir Aviation, Safran, Air Liquide and Daher formed the BeautHyFuel joint research project in June 2022 to design and ground test a hydrogen propulsion system rated for light aviation and develop a methodology so it can be certified for retrofit. BeautHyFuel benefits from the unique combination of Turbotech's ultra-efficient light turbine technologies, Safran's expertise as an aeroengine manufacturer and fuel system designer, Air Liquide's cryogenic hydrogen storage technologies for aerospace, Elixir's role as a manufacturer of innovative fourth-generation light planes, and Daher's experience in aircraft development, certification, production and maintenance.

The BeautHyFuel project is supported by the French government and DGAC through France's post-pandemic stimulus program. It complements other initiatives by Safran to reduce the greenhouse gas emissions of air transport.

Safran is an international high-technology group, operating in the aviation (propulsion, equipment and interiors), defense and space markets. Its core purpose is to contribute to a safer, more sustainable world, where air transport is more environmentally friendly, comfortable and accessible. Safran has a global presence, with 83,000 employees and sales of €19 billion in 2022 and holds, alone or in partnership, world or regional leadership positions in its core markets. Safran undertakes research and development programs to maintain the environmental priorities of its R&T and innovation roadmap.

Safran is listed on the Euronext Paris stock exchange and is part of the CAC 40 and Euro Stoxx 50 indices.



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Turbotech develops and manufactures innovative regenerative cycle microturbine engines, bringing new solutions to the light aviation market in terms of reliability, emissions reductions and comfort. These microturbines are available in two engine types for aircraft: turboprops and turbogenerators. Hydrogen propulsion is a new technological building block that adds to the innovations already developed by Turbotech, combining regenerative cycle turbine technology with hydrogen injection.

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