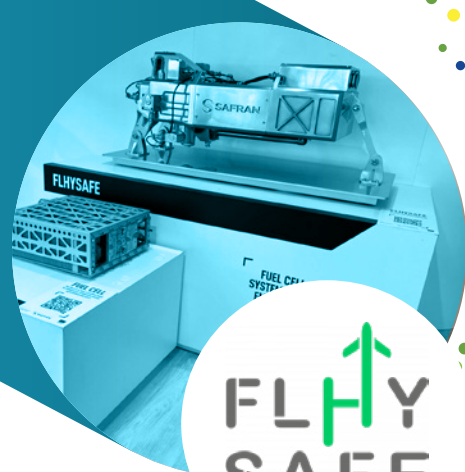


FLHYSAFE

FUEL CELL HYDROGEN SYSTEM FOR AIRCRAFT EMERGENCY OPERATION



Project ID:	779576
PRD 2023:	Panel 3 – H2 end uses – transport
Call topic:	FCH-01-1-2017: Development of fuel cell system technologies for achieving competitive solutions for aeronautical applications
Project total costs:	EUR 7 296 552.51
Clean H₂ JU max. contribution:	EUR 5 063 023.00
Project period:	1.1.2018–30.6.2023
Coordinator:	Safran Power Units, France
Beneficiaries:	ARTTIC, Commissariat à l'énergie atomique et aux énergies alternatives, Deutsches Zentrum für Luft- und Raumfahrt EV, Instituto Nacional de Técnica Aeroespacial Esteban Terradas, Safran Aerotechnics, Universität Ulm

<https://www.flhysafe.eu/>

PROJECT AND OBJECTIVES

In the shift towards 'more electric aircraft', fuel cell systems are considered one of the best options for efficient power generation. The main objective of FLHYSAFE is to demonstrate that a cost-efficient modular fuel cell system can replace the most critical safety systems and be used as an emergency power unit aboard a commercial aeroplane, providing enhanced safety functionalities. In addition, the project has the ambition of virtually demonstrating that the system can be integrated, respecting both installation volumes and maintenance constraints, using current aircraft designs.

NON-QUANTITATIVE OBJECTIVES

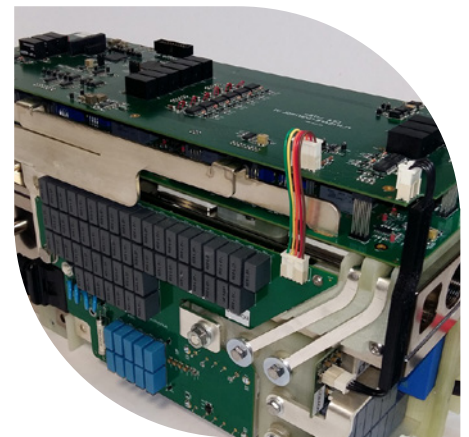
The project aims to demonstrate the capability of a fuel cell system to hold a profile load of a RAT in a demonstrator. Operational tests are ongoing, and a partial environmental test plan is in progress.

PROGRESS AND MAIN ACHIEVEMENTS

- The short stack was validated by H₂/O₂ tests.
- A critical design review of the low-temperature module for the fuel cell system was performed (theoretical A/C system specification has been completed).
- A demonstrator critical design review (for major subsystems) was performed.
- The first module campaign test was performed.
- The fuel cell stack was produced, and the converter integrated.
- The final demonstrator was assembled.

FUTURE STEPS AND PLANS

Operational and environmental tests of the FLHYSAFE demonstrator are ongoing.



QUANTITATIVE TARGETS AND STATUS

Target source	Parameter	Unit	Target	Achieved to date by the project	Target achieved?
Project's own objectives	EPU weight	kg	150	220	⚙️
	System power density	W/kg	≤ 100	78	⚙️
	Nominal continuous electrical power	kW	18.1	18.1	✓