MISSION

DE-RISKING AND PRIORITIZING A TECHNOLOGICAL DEMONSTRATOR BY SETTING UP A SYSTEM ENGINEERING APPROACH

AIRBUS

CONTEXT

Airbus is an international pioneer in the aerospace industry and a leading aerospace manufacturer. The group is the world leader on the A319, A320 and A321 single-aisle aircraft market.

As part of the CleanSky European project (the largest European research program aiming at developing innovative and advanced technologies to reduce aircraft CO2, gas and noise emissions), the eFTD project (Electrical Flight Test Demonstrator), aimed at making 8 innovative technologies mature by flight tests on representative aircraft environment (A320), among which:

- The ice detection system,
- The new generation electric airplane system,
- The cabin and cargo air conditioning system (with an external air intake).

This 3-year duration R&T project brings together 9 European partners, 5 countries and around 250 people.

OBJECTIVES

CESAMES has been asked by Airbus to coach its teams on the eFTD project with the following objectives:

- **To verify the feasibility** of a **system engineering approach** at the airplane level,
- **To reduce the risks** of the project and **anticipate** the installation of innovative technologies on the flight demonstrator,
- **To ensure an effective decision-making** through the prioritization of valuable test needs
- **To ensure the overall convergence of stakeholders** on the global architecture of the aircraft system (more than 40 stakeholders and 18,000 additional parts on the A320 test aircraft)
- **To define a product trajectory** starting from the existing airplane and arriving at the modified airplane

SOLUTION

In order to achieve these objectives, CESAMES has supported Airbus on a structured program of 10 coaching sessions, involving 4 to 11 key project stakeholders (project manager, experts, test and integration teams). These sessions led to the creation of a coherent architecture file of the technological demonstrator by Airbus integrating:

- **The definition of the problem and the system of interest**
- **Requirements architecture and test constraints**
- **The definition of the life cycle and operating concepts of the demonstrator**
- **Identification of the functional and physical impacts** of new technologies in the existing test aircraft (A320 MSN01)
- **The trajectory of modification and refurbishment** of the test aircraft

RESULTS

The benefits for Airbus of the CESAMES approach were as follows:

- EFTD test campaign: **300 hours of laboratory tests, 13 hours on the ground and 27 hours of flight** and refurbishment of the aircraft without major difficulty;
- **On-time delivery** of the platform and technological results;
- **Prioritization of requirements** to focus testing on the **30% of key value requirements**;
- **Budget saving:** half the price of the initial request/the cost of the project was divided by 2 compared to the initial request.

CESAMES STRENGHTS

- **Very professional teams** which helped structure the organization of Airbus teams
- **Attentive architects,** who are **proactive and able to understand the issues**

Jonathan Rigaud

eFTD leader - A/C Architecture & Integration, AIRBUS

« CESAMES has enabled Airbus teams to develop a robust and flexible architecture through a system engineering methodology, from the feasibility stage (design) to the PDR (Preliminary Design Review) »

« The coaching sessions allowed me to understand the core principles of systems engineering and its added value. This has allowed Airbus to be robust to change and to have a solid project that is a real success »