Title: “Toward a More Electric Falcon business Jet”

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Abstract

A "More electrical" Falcon business aircraft needs to provide a high level of service. Innovative Electrical System shall achieve a high level of dispatch rate and even improve it, compared to classical systems. Less pollutant fluid shall be used for a greener aircraft. However, reaching the aircraft safety objectives can appear a challenge and would require a good confidence in the failure rate of the E-Systems, having generally more electronics, more power conversion and more equipment. To achieve this goal, clever and simplified E-System architectures shall be envisioned.

Introduction

The main design drivers of a business aircraft are its dispatch rate, its range (y weight and fuel consumption), its production and maintenance costs, and its environmental impacts.

To perform the assessment the E-technologies at aircraft level, system modelling are validated with the help of bench facilities, such as the Clean Sky_Electrical Cooper bird and Clean Sky-Thermal bench.

Electrical Cooper bird

Based in France, this tool allow to test all individual More Electrical components, new electrical high voltage network and the operation of those E-systems for various kind of aircraft configurations.
**Thermal bench**

Based on Germany, this bench allows testing of basic equipment thermal models, as well as complete fuselage sections.

It allows the investigating of heat transfer and new cooling principle, a key success for integration of power converters.

![Thermal bench image](image)

**Digital Factory and Aircraft Maintenance**

The CATIA PLM Systems is changing the aircraft testing, self-generating the aircraft test procedures. E-Systems will allow a step further with systems self-tests, continuing the mutation in operators skills toward the digital factory.

Even more, E-Systems will have a better knowledge of their internal status, and dispatch with some detected partial failure shall be possible, whilst with current pneumatic systems it is not the case. E-System self auto-reconfiguration shall also be possible.

This shall reduce the production and maintenance costs, as well as the aircraft immobilisation time. Dispatch rate shall be improved.

Safety shall also be improved with less hidden or dormant failures.

**EMI/HIRF/Lightning**

The EMI/HIRF/Lightning threats have also to be taken in account in the E-Systems integration.

**Conclusions**

Many challenges are still to be overcome to get E-systems on a business aircraft, but expectations are high to improve aircraft efficiency and availability, whilst being more economic and more ecologic to produce and to use.

![Aircraft image](image)

**References**

None.