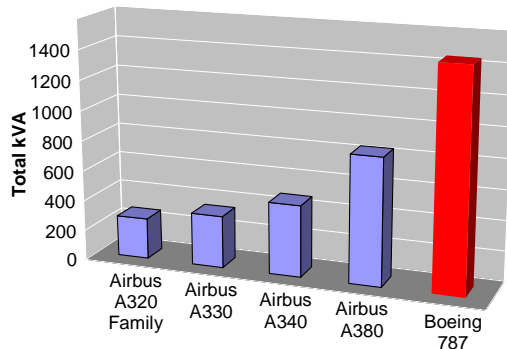


ELPOC

ELectrical Power Control

State of the art – Background

Electrical Power Generation requirements have been steadily increasing as large civil aircraft have been becoming more electric. This is illustrated in the graph below.



Through the development of new More Electric Aircraft architectures, traditionally-used hydraulically and pneumatically-powered equipment is being replaced with electrical equipment due to the advantages this brings in terms of energy efficiency, modularity and associated cost and weight benefits.

One area of innovation is engine starting, where traditional pneumatic starters can be removed if the electrical generators are replaced by starter-generators. High-power Starter-Generators are therefore being developed, to respond to the increasing electrical power generation requirement of the More Electric Aircraft, but also to provide the additional, complementary, function of Engine Start.

Objectives

The objectives of the ELPOC project are to investigate optimised architecture options that can offer differentiating performance and features to facilitate future More Electric Aircraft improvements through novel configurations of power electronic controls and electrical system technology. These technologies are developed through equipment-level analysis and testing, as well as sub-system and system-level testing.

Description of work

The ELPOC project incorporates:

- Architecture option studies to define the power electronic controls, machine and electrical system configuration to be demonstrated.
- Machine and Power Electronic design and development work aimed at equipment-level and system-level performance optimisation
- Demonstration of the technologies through sub-system and system testing prior to integration into an aircraft systems rig.

Results

In the time frame of this programme a large (200kVA) new technology starter generator and its associated power electronics were design manufactured and tested in order to mitigate the technological risks in the way of the more electrical aircraft availability.

a) Timeline & main milestones

Starting date: June 2011
Ending date: September 2015
Duration: 51 Months
12 technical deliverables were issued (not including the programmatic one)
3 Main milestones of the project were reached.

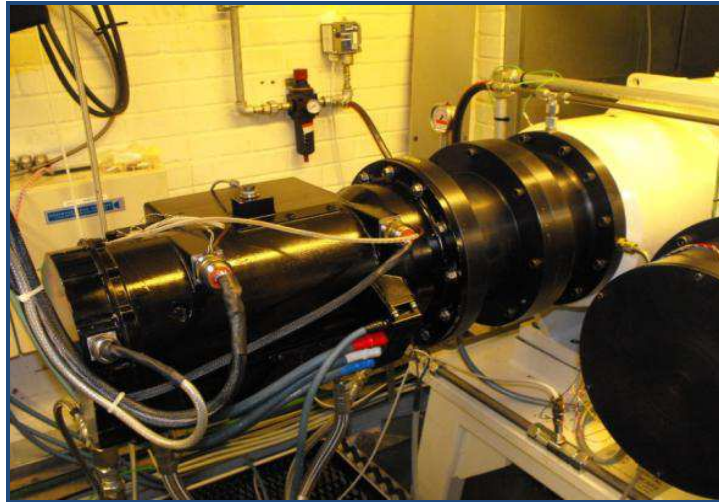
b) Environmental benefits

The objectives of the More Electric Aircraft are to reduce the environmental impact of aircrafts by changing hydrolic systems and air systems by electrical systems. The main source of the electrical power of the aircraft is the main generator. The benefit in term of environmental is direct because this system is in between the engine and the aircraft and by merging the 2 functions (start and generation)the objective is to reduce weight and reduce the power off take from the engine to provide higher level of power available for the aircraft. That means directly fuel burn benefit.

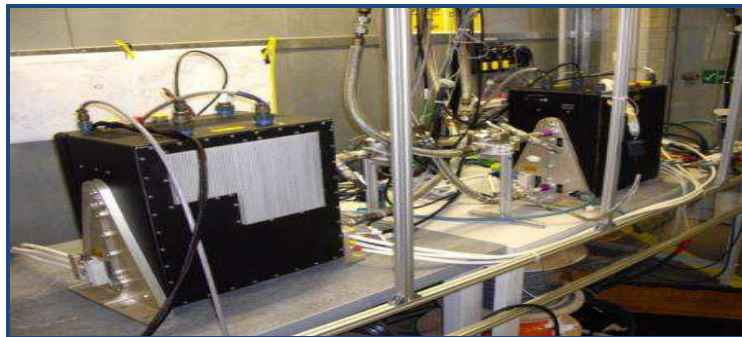
c) Maturity of works performed

All the system has reached a TRL5 during this project.

Picture, Illustration



ELPOC 200kVA Starter/Generator



ELPOC associated Power Electronic

The ELPOC System

Project Summary

Acronym : ELPOC

Name of proposal: Electrical Power Control

Technical domain: Electrical Start and Electrical Generation

Involved ITD SGO

Grant Agreement: 267210

Instrument: Clean Sky JU

Total Cost: 1,963,979.54 €

Clean Sky contribution: 495,510.00 €

Call: **Call for Proposal Fiche JTI-CS-2009-2-SGO-04-002**

Starting date: June 2011

Ending date: September 2015

Duration: 51 Months

Coordinator contact details:

Philip McGoldrick
Safran Power UK Ltd
Tel : +44 (0) 1296 663 491
Email : phil.mcgoldrick@goodrich.com

Project Officer: Antonio Vecchio

Antonio.Vecchio@cleansky.eu

Participating members GOODRICH POWER SYSTEMS (up to April 2013)

SAFRAN POWER UK (PTRO)

AIRBUS