Toward a More Electrical Falcon Business Jet
Agenda

• What is about @ aircraft level?
• What for? ➔ Design drivers
• Means of evaluation and validation
• Challenges of E-Systems
• Wrap-up
**MEA- What is about @ aircraft level?**

"Less engine bleed off-takes"  "Less hydraulic lines"

→ More engine electrical off-takes with Systems Powered By-Wires
The main design drivers @ aircraft level

- Dispatch rate/ equipment reliability
- Range/ weight/ fuel consumption
- Production & maintenance costs
- Environmental impact
MEA- Means of evaluation and validation

- System modeling, energy management modeling, aircraft assessments
- Electrical network evaluation and modeling validation @ Clean Sky_Copper bird
MEA- Means of evaluation and validation

- Thermal evaluation and modeling validation @ Clean Sky-Thermal bench

- Wind tunnel testing/ aircraft testing
Architectures & Aircraft assessment

- Clever choice of E-system operation and associated electrical architecture with optimization of the power losses
- Could require more equipment and space allocation compared to classical system pending E-choices, weight compromise including:
  - Heat thermal management: multiple concept looks @
  - EMI/HIRF/Lightning protection aspects
  - PbW routing
- Implies more electronics, power conversion
  - Achievement of system failure rate objectives is a challenge
  - Reliability needs to be addressed in design phase, taking in account the product life
  - Power electronics and power conversion density shall continue to progress
MEA- Challenges of E-Systems

Dispatch & Operation  Production & Maintenance

« plug an play equipment » « better failure diagnostics » « green technologies »

- Should improve dispatch rate thanks to continuing operation with partial failures

- System self-reconfiguration shall be possible

- Less hidden/dormant failures
MEA- Challenges of E-Systems

Dispatch & Operation
Production & Maintenance

« plug an play equipment » « better failure diagnostics » « green technologies »

- “Digital factory”: continues the changes brought by the CATIA PLM systems: system automatic tests, new operator skills, less usage of pollutant fluid

- Shall reduce production/maintenance cost and immobilization time

but the equipment cost will depend on forthcoming choices to be made by airliner manufacturers
More Electrical Systems for a « More Electrical Falcon »

« Innovative and efficient» « EASy to use» « Economic and ecologic »