The Subcontractor Dilemma

In the commercial aerospace industry

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GE

2004: Project kickoff
2005: Component Verification
2008: Component Qualification
2010: Production ramp up + PIP2
Component qualification 2008
GE

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- 2005: Component Verification
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BTL

- 2004: Supplier Investment in the project
- 2005: 5 Stages vanes industrialization
- 2008: Final qualification
- 2010: Production ramp up + PIP2
GE

- 12% improved fuel consumption (2 M$ /Plane / Year)
- Reduced CO2 emission
- Noise reduction (12 – 17 % in noise footprint)
- Low Cost – Maintenance & Spare parts

BTL Challenge

- Highly complex geometry
- Tighter profile tolerances
- Tighter Leading edge tolerances
- Fast development and reaction to quick changes
- Low production cost
CFM 56 Rotor - “Old design”  

GENX Stg. 5
Long term financing: 7 – 9 years ROI

High risk (no success guaranteed)

Fast development tools required – simulations and offline programming

Demanding geometries require advanced machining technologies

Investment in new production technologies - Capital
Forging process simulation

- Reduced risk
- Faster design
Leading Edge profiling

- Higher accuracy
- Improved stability
- Lower cost

**Manual process**

**Automated process**
Advanced metrology tools

- 3D optical metrology – white light
- Fast comparison between Part and mode
Conclusions

• Be ready for long term “Risky” investment
• Build infrastructure for continues investment in technology
• Build contacts for Concurrent engineering From the first step.

• It’s the big boys game!
Thanks!