Nadcap Symposium
September 2013

Andy Page
Rolls-Royce

Order book
£60.1bn

Underlying Group revenue
£12.2bn

Underlying profit
£1.4bn

Underlying Group revenue by business segment
- Civil aerospace: 53%
- Defence aerospace: 20%
- Marine: 18%
- Energy: 8%
- Engine Holding: 1%
Key drivers of the future special process supply chain

• A constantly changing and increasing level of *Technology*;
  – Additive Manufacture, composites
  – Laser shock peening, part marking, non-conventional machining
  – New regulations such as REACH

• *Competition* increasing as 1st Tiers in-load special processes
  – Heat treatment, NCM, Surface Enhancement, Chemical Processing

• Customer *Quality* expectations will always increase

• *Capacity* requirements in line with sector growth
  – 2000 Trents to be delivered in the next 5 years, the same as the last 18 years
Special Process Supply Chain overview

- Rolls-Royce signed up to Nadcap in
  - 1994 for NDT in the USA
  - 1997 for Materials Testing
  - 2000 for NDT in USA internal factories
  - 2001 for NDT and Mech Test by RR UK
  - 2003 all other required processes
  - 2005 all internal aero OEM facilities
  - 2010 internal repair facilities for NDT

- ~600 approved suppliers
  - Suppliers spread over 26 countries
  - ~1000 Special Process approvals in our Global supply chain
  - Currently our supply chain is > 95% approved by Nadcap

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RR and NADCAP

• Rolls-Royce is fully committed to Nadcap;
  – Nadcap Board, Nadcap and NUCAP Management Councils and all Mandated Task Groups
  – Rolls-Royce have reduced Special Process audits in line with mandates

• Rolls-Royce’s internal and external mandates cover:
  – Chemical Processing Coatings
  – Composites Heat Treatment
  – Non-Destructive Testing Non-Conventional Machining
  – Surface Enhancements Welding

• Potential Future Mandates
  – Electronics, Elastomers and Seals, Conventional Machining

• Leading the implementation of the new Measurement and Inspection Task Group
NADCAP benefits to Rolls-Royce

• Rolls Royce utilise NUCAP to audit our internal supply chains.

![Rolls-Royce Internal NUCAP NCR Reduction](image)

• Externally many of our suppliers have improved,
  – reduced rework, scrap and non-conformance, including:
    - Increased Control of Fusion Welding Process
    - Process control charts for furnace control
    - Training Programme For Vacuum Furnace Operators
    - Detailed Standard Operating Procedures
    - EBW Preventative Maintenance
    - Focussed efficient audit process

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NADCAP benefits to Suppliers

• Audits
  – Drives compliance to all primes specifications in one audit.
  – Reduction of prime audits
  – Drives competence and knowledge
  – Drives consistency and operational stability

• Conferences
  – Can change and influence checklist contents
  – Networking with other suppliers
  – The Supplier Support Committee
  – Can identify gaps in knowledge of current and new equipment
  – Excellent marketing tool

Makes you question what is your best practice

Composite Example; Audit led to raw material Control, training development and document control

In the long term Nadcap embeds Process Excellence and Compliance

One US supplier believes Nadcap has been the best marketing tool they have ever had.
NADCAP addresses the key drivers

- A constantly changing and increasing level of *Technology*;
  - Fast and efficient access to the latest knowledge and a community of experts
  - Training and qualification directly related to Auditing, Quality and Technical aspects of Special Processes through eQualearn and eQualified

- **Competition** increasing as 1st Tiers in-load special processes
  - Differentiation through technology, driving up capability
  - 54% of Nadcap accredited suppliers report an increase in sales or improved ability to attract customers
  - 15% of Nadcap accredited suppliers report increased publicity

- Customer *Quality* expectations will always increase
  - 85% of Nadcap suppliers agree that audits have improved their Quality

- **Capacity** requirements in line with sector growth
  - Stable and capable operations enabling effective capacity planning
NADCAP is unique in being able to deliver this.

- Truly Global Standard
  - Produced and continuously improved by industry experts
  - Industry led for the benefit of Industry

Pratt and Whitney
Liebherr Aerospace
DCMA
Airbus
Rolls-Royce
Ball Aerospace
Lockheed Martin
SAFRAN
Parker Aerospace
309 Maintenance Wing
Spirit Aerosystems
BAE Systems
General Dynamics
Embraer
Hamilton Sundstrand
MTU
Fountain Plating Company

Rockwell Collins
EADS CASA
GE Aviation
Volvo Aero Corporation
Raytheon Company
Alenia Aeronautica
IAI
Eaton Aerospace
Goodrich Corporation
Northrup Gruman
Exova
Alcoa
Kaman Aerospace
Dearborn Precision
AAA Plating
Advanced Chemistry and Technology

Bombardier Aerospace
Bell Helicopter
Bombardier Aerospace
Honeywell
Beechcraft Corporation
Vought Aircraft
Howmet Thermatech coatings
The Boeing Company
Avcorp Industries
Voss Industries
Sonaca
Eurocopter
Nex Tech Processing
Heroux Devtek
FM Callahan and Son
Sikorsky

Red = EU Blue = US
NADCAP is unique in being able to deliver this

- Specialists from each prime attend the Task Groups, producing a unique composition of the most knowledgeable people specific to the special process
- Plus representatives from many National and International specialist bodies

Nadcap Welding Task Group

- American Standards Representative AWS
- British Standards Representative BS
- German Standards Representative DNS
- French Standards Representative AFNA
Sharing in Growth

A £120M programme of intensive supplier development and improvement for UK High Value Manufacturing Suppliers

Open invite briefing at the Advanced Manufacturing Research Centre in Sheffield on 1st October 2013

Further information at www.SIG-UK.Org
You get out what you put in!