Rolls-Royce research & technology
Importance of university partnerships

Neil Takei
VP Business Development - Japan
Four global markets
Underlying revenue £10.9bn*

Civil Aerospace  £4.92bn
Defence Aerospace  £2.12bn
Marine  £2.59bn
Energy  £1.23bn

R&D Expenditure £923m

*2010 results
Rolls-Royce Technology ‘Vision’

- **Vision5** – Near term
  - Latest ‘on-the-shelf’ technologies applied to existing architectures
  - Near term upgrade and improvement programmes

- **Vision10** – Next generation
  - Leading edge, technology validation.
  - Technologies currently at demonstration stage

- **Vision20** – Future generation
  - Includes technologies that are currently emerging or as yet unproven
  - Advanced environmental and efficiency
  - Targets for aircraft, engines and systems.

The ACARE Goals
- Half current perceived average noise levels
- Reduce CO₂ by 50% per passenger km
- 80% cut in NOx
Research and Technology management

Rolls-Royce Strategic Intent

R&T Strategy Planning

New Product Planning
Full Concept Definition
Product Realisation
Production
Service Support
Disposal

New Capability Realisation

Facilities
People/skills
Supply Chain
Infrastructure

Strategic Research
Applied Research

Technology Validation
• Generic
• Project specific

UNIVERSITY TECHNOLOGY CENTRES

Global Academic Network

Research and Technology Programme
Benefits of University Research Environment

- Specialised skills
- ‘Time to think’
  - Escape from short term problems
- Challenge and dialogue
  - Multi-sectoral perspective
- Long term capability development
  - Recruitment & training skilled personnel
Centres of Excellence – Since 1985

- Rolls-Royce progressively introduced a ‘Centres of Excellence’ approach for >90% of all its academic research
- Focused on proven, world-class research groups
- Sponsored and “owned” by internal engineering teams
- Dismantled competing internal research
- Growth initially in UK then increasingly international as the Company global footprint expanded
Critical success factors

- Central control of policy, direction and budgets
- Partnership with Government agencies
  - Funding and support for university infrastructure
  - Support for complementary basic research
  - Support to attract key researchers
- Up front agreement on IPR, publication, etc.
- Joint review and measurement of quality, results, IPR capture, technology and skilled staff transfer
- Customisation of approach for different countries and cultures
Advanced Manufacturing Research Centres UK (AxRC)

**AFRC (Advanced Forming Research Centre)**
- Location: Glasgow UK
- Funding: Scottish Enterprise
- Subject: Forging & Forming
- Strathclyde University

**AMRC (Advanced Manufacturing Research Centre)**
- Location: Sheffield UK
- Funding: Yorkshire Forward
- Subject: Machining & Measurement
- Sheffield University

**MTC (Manufacturing Technology Centre)**
- Location: Ansty UK
- Funding: AWM & EMDA
- Subject: Automation, Fixturing, Joining, etc
- Birmingham, Loughborough, Nottingham Unis

**NAMRC (Nuclear Adv Manufacturing Research Centre)**
- Location: AMP Sheffield & Manchester Univ
- Funding: BIS YF & NWDA
- Subject: Manuf Techy, training & accreditation
- Sheffield and Manchester Universities

**NCC (National Composites Centre)**
- Location: South West
- Funding: BIS and SWRDA
- Subject: Composites
- Bristol University

Rolls-Royce data-strictly private