

## OPERATIONS

### Record levels of investment continue to drive improvements in product and operational performance.

**Alain Michaelis**  
Operations Director



Our teams around the world focus on improvement in all the classical operational metrics – safety, quality, cost, on-time delivery, inventory – while at the same time ensuring that the next generation of advanced products and processes are successfully industrialised.

Our operations employ 25,000 people in 17 countries at 85 Rolls-Royce facilities. In addition, 33 joint venture facilities, seven manufacturing technology partnerships and over 70 significant suppliers help us to meet customer demand.

#### Developing our capacity

This year we have extended our own capacity and capability. This included our new turbine blade factory in Rotherham, UK and our new 17,000 square metre, state-of-the-art discs manufacturing facility in Washington, UK, that has now started production. When fully operational later this year, it will have the capacity to manufacture over 2,000 fan and turbine discs annually. We are also taking steps to adjust capacity where market segments are contracting or demanding a lower price point. Although our diverse portfolio helps us balance growing and shrinking segments, we do expect an ongoing need to adjust capacity through plant renewal and closures.

#### Advanced manufacturing

We apply advanced technologies, methods and processes to deliver 'best in class' manufacturing performance through our Rolls-Royce Production System and the Advanced Manufacturing network, which has developed over the past five years.

The advanced centres in this network bring together university, government and industrial partners to provide a realistic testing ground for new industrial techniques that improve yield and reduce costs. These have proved to be successful both for Rolls-Royce and our supplier partners.

The Advanced Forming Research Centre in Glasgow, UK, the National Composites Centre in Bristol, UK and the Manufacturing Technology Centre in Coventry, UK, are expanding their facilities and the new Commonwealth Centre for Advanced Manufacturing in Richmond, USA, is now fully operational.

Our future Advanced Remanufacturing and Technology Research Centre in Singapore and High Temperature Components Centre of Excellence in the UK will ensure we lead in high-performance, low-emission turbine technology.

Our processes will increasingly include powder-based manufacturing, additive layer manufacturing technologies and ultra-high temperature materials. 'Knowledge-based manufacturing' is another developing area. Here, we will use dynamic computer models to design and verify processes. These approaches will increase design flexibility, speed of manufacture and performance.

#### Suppliers

Strong relationships with our suppliers are critical to our performance. We work closely to align our strategies as well as assessing performance through our Supplier Advanced Business Relationship (SABRE) requirements.

Rolls-Royce has taken a leading role in the establishment of the Aerospace Engine Supplier Quality Committee. Through this body, gas turbine engine makers and their suppliers – with input from regulatory agencies – aim to agree a set of common industry-wide standards. These will help remove variability and waste, enabling the aerospace supply chain to be leaner and more competitive.

To support UK suppliers in the global aerospace market, Rolls-Royce is sponsoring the UK Government-backed Sharing in Growth programme. It is a £110 million programme of intensive supplier

development training and is expected to secure at least 5,000 high-value manufacturing jobs in aerospace. We are also supporting a £76 million Sharing in Growth programme in the nuclear industry.

We continue to seek new capabilities in emerging markets across the world through our supplier development groups. These help drive competition with our existing internal plants and suppliers, and also allow us to develop new markets – Brazil (Energy) and China (Marine) being good examples. We expect the proportion of our supplier spend in emerging markets to increase.

#### Information technology

In 2013, we invested over £100 million in IT, continuing with the modernisation of our IT infrastructure and also launching our Shop Floor IT modernisation programme. We have launched an Integrated Production Systems programme to address the need for simplified, globally scalable and secure systems. The programme will improve delivery to the customer whilst improving efficiency and reducing operating costs. We are also investing in our customer systems to improve the customer experience through the use of portals and digital workflow.

## £687 million

**Expenditure in 2013 on property, plant and equipment.**

We are delivering customer and business benefits as we continue to invest at record levels and transform our industrial infrastructure.