

## **Chief Executive Review**

### **Introduction**

Rolls-Royce made good progress in 2017, achieving a number of important operational and technological milestones. Financial results were ahead of our expectations as we delivered growth in underlying revenue, underlying operating profit and free cash flow. This was achieved while focusing on managing in-service fleet issues on the Trent 1000 and Trent 900 engines that led to increased costs as efforts were made to minimise the disruptive impact on our customers and to develop longer-term solutions. There was better understanding across the business of the need for cultural change and tangible progress in our efforts to increase openness and transparency with investors. In 2017, we strengthened the executive leadership team (ELT) as we continued to drive cultural change across the Group. We completed our strategic update and are ready to move forward in our drive for pace and simplicity, restructuring from five to three businesses, with a review of strategic options for our commercial marine operation.

### **Good progress in 2017**

Civil Aerospace had some notable successes in 2017 with record levels of large engine deliveries, further expanding the installed fleet and generating service revenue growth. We made good progress with our new large engine programmes, achieving the first flight of three new engine designs within a twelve-month period. Power Systems delivered a strong performance in its first year with new leadership, streamlining the product portfolio and making new inroads into the Chinese market. Defence Aerospace had another solid year as we renewed a number of core US contracts and further developed our service delivery capability. We delivered operational improvements in Nuclear, while in Marine we established leadership in ship intelligence and autonomous shipping. We also received regulatory approval for the acquisition of ITP Aero which was completed on 19 December 2017.

### **Challenges in 2017**

The Group faced several challenges in the year. These are not unusual given the nature of the industries in which we operate. In Civil Aerospace, production milestones were achieved against a backdrop of capacity constraints, primarily blade manufacturing and test bed availability, driven by the in-service fleet issues on the Trent 1000 and Trent 900. As we gained a fuller understanding of the extent of the technical issues involved during the year, we increased our estimates of additional maintenance activity required to mitigate problems, to develop longer-term solutions and to support customers through a proactive engine management programme. In Marine, with the average Brent crude oil price remaining below \$55 per barrel for the third consecutive year, our commercial marine operation continued to see substantially reduced activity levels in its historically important offshore market.

### **Restructuring**

Efficiencies from the 2015 transformation programme have achieved run-rate cost savings at the top end of our initial expectations of £200m by the end of 2017. However, costs and complexity within the Group remain too high. The further simplification announced in January 2018 to move from five to three operating businesses will enable us to act with greater pace, to innovate in core technologies and to better take advantage of future opportunities in areas such as electrification and digitalisation. It will also help us to undertake a more fundamental restructuring to remove duplicated support and management functions.

Within the Group we appreciate that talk of simplification must translate into greater enablement for our people if we are to succeed in bringing about lasting change. These efforts must begin with our leaders and during the year I brought in additional talent and experience to the ELT with the appointment of Stephen Daintith as Chief Financial Officer, Paul Stein as Chief Technology Officer and Simon Kirby as Chief Operating Officer. In early 2018, we announced Chris Cholerton would be taking up the post of President – Civil Aerospace, Tom Bell would be returning to Rolls-Royce as President – Defence and Harry Holt took up the post of Group HR Director.

## Group Trading Summary

The table below and all commentary relates to underlying performance unless otherwise stated

£m	2017	2016	Change	Organic change
<b>Order book*</b>	<b>78,476</b>	<b>80,910</b>	<b>-3%</b>	<b>-3%</b>
<b>Underlying revenue</b>	<b>15,090</b>	<b>13,783</b>	<b>+9%</b>	<b>+6%</b>
Underlying OE revenue	7,687	7,027	+9%	+6%
Underlying services revenue	7,403	6,756	+10%	+7%
<b>Underlying gross profit</b>	<b>2,973</b>	<b>2,818</b>	<b>+6%</b>	<b>+1%</b>
Gross margin %	19.7%	20.4%	-70bps	-100bps
Commercial and administration costs	(1,168)	(1,158)	+1%	-3%
Research and development costs	(737)	(862)	-15%	-18%
Joint ventures and associates	107	117	-9%	-13%
<b>Underlying operating profit</b>	<b>1,175</b>	<b>915</b>	<b>+28%</b>	<b>+22%</b>
<b>Underlying operating margin</b>	<b>7.8%</b>	<b>6.6%</b>	<b>+120bps</b>	<b>+100bps</b>
Financing costs	(104)	(102)	+2%	
<b>Underlying profit before tax</b>	<b>1,071</b>	<b>813</b>	<b>+32%</b>	
Tax	(328)	(261)	+26%	
<b>Underlying profit for the year</b>	<b>743</b>	<b>552</b>	<b>+35%</b>	
<b>Underlying earnings per share</b>	<b>40.46</b>	<b>30.13</b>	<b>+34%</b>	
<b>Free Cash Flow</b>	<b>273</b>	<b>100</b>	n/a	

\*The 2016 opening order book has been restated by £1.5bn reflecting a methodology change in the exchange rates used to translate order books – moving from long term planning rates to period spot rates - for overseas subsidiaries, and a restatement of Defence's order book opening balance by £(441)m.

### Underlying revenue up 6%

Group revenue rose 6% to £15,090m, reflecting 6% growth in original equipment and 7% in services. Civil Aerospace led the progress, with revenues up 12% reflecting strong growth in OE engine delivery volumes (up 5% in total and up 35% for widebody). Services revenues at Civil Aerospace rose 12%, benefitting from the growing installed base of in-service large engines, which rose 7% to 4,409. Power Systems revenue grew 3% driven by growth in commodity-related markets, construction & agriculture and power generation business. Marine revenues were weak, down 9%, reflecting ongoing weakness in the offshore oil & gas markets. Nuclear revenues rose 4%.

### Gross profit up 1%

Gross profit rose 1% to £2,973m, with gross margins of 19.7%, down 100bps in the year. This decline was driven by both Civil Aerospace and Defence Aerospace. Civil Aerospace margins reflected the impact of higher volumes of unlinked OE engines, which carry an OE deficit, allied to lower long term service agreement (LTSA) margins and other related costs driven by additional maintenance costs on Trent 1000 and Trent 900. Defence Aerospace gross margins were impacted by lower spares volumes and lower LTSA contract margin improvements. Power Systems saw a strong gross margin improvement of 240bps, principally reflecting improved product mix and pricing discipline.

### R&D costs down 18%

Gross research & development expenditure grew 1% to £1,392m. After funding from customers and other third parties, self-funded R&D rose 7% to £1,035m. This was primarily driven by increased investment in Civil Aerospace with the development of a number of new engines plus ongoing investment in existing product improvement, including fuel burn efficiency enhancements. Capitalisation of R&D rose from £99m to £342m due to the stage of development programmes and included £83m from a policy application change. Contributions from risk & revenue sharing partners declined £24m. Overall the underlying expensed R&D charge fell 18% to £737m.

### **C&A costs down 3%**

Commercial & administrative costs were £1,168m, 3% down on the prior year, reflecting the beneficial effects of transformation actions to reduce overhead costs. Looking ahead to 2018 and beyond, we expect to realise additional benefits from further restructuring of our support and management functions.

### **Exceptional restructuring charges**

£104m of exceptional restructuring charges were taken in 2017 (£129m in 2016) primarily due to restructuring at Power Systems and Defence, reflecting actions to remove cost and improve operational efficiency.

### **Underlying operating profit up £260m**

Underlying operating profit of £1,175m (2016: £915m) was up 22% reflecting a number of factors:

- Civil Aerospace profit increased to £520m, up 34% with positive margin contribution from higher linked Trent 700 OE sales, increased services revenues and higher sales of spare parts. This was offset by higher costs relating to the Trent 1000 and Trent 900 in-service engine issues, with £227m of costs charged for these. Expensed R&D fell £156m to £412m reflecting increased capitalisation
- Defence Aerospace profit of £374m was down 7% due to lower demand for engine spares, higher restructuring costs and a £14m reduction in LTSA contract margin improvements taken in 2016. These more than offset the non-repeat of the TP400 charge of £31m in 2016
- Power Systems made excellent progress in 2017, with profit of £330m up 61%, reflecting 3% revenue growth, a 240bps expansion in gross margin, due to better mix and pricing discipline, and benefits of overhead cost reduction actions which saw C&A costs fall 7%
- Despite the 9% decline in Marine revenue, restructuring drove a material reduction in overhead costs with C&A costs 13% lower, helping to reduce underlying operating losses to £25m (a £2m improvement versus 2016)
- Nuclear operating profit of £38m was 18% lower versus 2016, primarily reflecting a higher R&D charge of £23m compared with the £6m incurred in 2016 which had benefitted from a one-off positive of £7m due to the change in treatment of R&D credits

### **Payment to shareholders held flat**

For 2017 the final payment to shareholders is held at 7.1 pence giving a full year payment of 11.7 pence (2016 full year: 11.7 pence), a cash cost of £216m. Restoring our shareholder payments to an appropriate level over time as free cash flow grows will be a key capital allocation priority.

### **Reported results**

Reported profit before tax was £4.9bn, a material increase over the 2016 loss of £4.6bn. This included £798m of gains resulting from the acquisition of ITP Aero, a positive FX mark-to-market adjustment of our hedge book of £2.6bn (£4.4bn negative in 2016), a charge of £671m for financial penalties from agreements with investigating bodies in 2016, a charge (principally relating to the Vickers Group Pension Scheme) of £306m for the restructuring of the UK pension schemes in 2016 and goodwill / other impairments of £24m versus £219m in 2016. This also includes improvements in other operational performances as highlighted above.

### **Free cash flow improving**

Free cash inflow in the year was better than expected at £273m (2016: £100m), excluding the £14m post-acquisition cash outflow of ITP Aero. The strong cash flow performance was driven by higher profitability at Civil Aerospace, Defence Aerospace and Power Systems and good working capital performance, again principally in receivables, across the Group. This was achieved despite £98m of higher R&D cash spend in 2017, a £188m increase in capital expenditure and the reversal of the £180m working capital management benefit generated in the first half. Trading cash flow at Civil Aerospace of £38m was unchanged year on year. This reflected increased flying hour receipts and higher spare parts sales, offset by an increased outflow from higher deliveries of OE widebody engines and the higher Trent 1000 accelerated maintenance activity. Total cash costs incurred in the year on Trent 1000 and Trent 900 in-service issues were £170m (2016 £90m).

Looking ahead, improved Civil Aerospace engine OE economics and increased engine flying hours will drive a further improvement in free cash flow in 2018 and beyond. More details on the movement in trading and free cash flow are included in the funds flow section of the Additional Financial Review.

### **IFRS 15**

As highlighted in 2016, the introduction of the new revenue reporting standard, IFRS 15 *Revenue from Contracts with Customers*, will change fundamentally how Rolls-Royce measures its revenues and profits, Civil Aerospace having by far the largest impact. There are three broad implications:

- Linked accounting will cease to exist so all OE sales will be treated on the same basis;
- OE engine cash deficits will no longer be capitalised and recorded as contractual aftermarket rights, they will instead be recognised on delivery;
- Revenue and profits for aftermarket services will be recognised on an activity basis as costs are incurred.

Further information on the 2017 results under IFRS 15 can be found on page 26.

### **Net debt**

In 2017 the Group's net debt position rose from £225m to £520m (excluding ITP Aero) largely reflecting the £273m free cash generation offset by shareholder payments of £214m and £286m covering payments due in 2017 for the financial penalties from agreements with investigating bodies. A further £378m of regulatory fines remain due to the SFO, with a payment schedule extending to 2021.

Following the acquisition of ITP Aero, its operating cash outflow of £14m and the consolidation of the net funds of £215m result in Group net debt rising somewhat less to £305m.

### **Credit rating**

The Group is committed to maintaining a robust balance sheet with an investment-grade credit rating. We believe that this is important for our customers given that we deliver high-performance products and support for equipment which will be in operation for decades. Standard & Poor's updated its rating in January 2017 to BBB+ from A-/negative outlook, with Moody's lowering its rating in February 2017 from A3/stable to A3/negative.

### **Foreign exchange**

The Group hedges transactional foreign exchange exposures to reduce volatility of revenues and costs. The most significant exposure is net US dollar income which is converted into GBP (currently approximately \$5bn per year and forecast to increase significantly by 2021). The Group has a hedge book of \$38.5bn (at an average rate of USD:GBP1.55) covering this exposure. We expect the achieved £/\$ hedge rate to remain unchanged at around USD:GBP1.54 for the coming 3 years.

### **Interest**

Interest and other financing costs remained broadly flat year-on-year, up £2m to £104m. Net interest payable reduced by £10m to £53m. Other underlying financing costs increased by £12m to £51m.

### **Taxation**

Underlying taxation was £328m (2016: £261m), an underlying rate of 30.6% compared with 32.1% in 2016. The underlying tax rate remains high due to the continued non-recognition of deferred tax assets on losses in Norway and the mix of profits arising in higher tax rate countries, predominantly the US and Germany.

## Civil Aerospace overview

2017 marked some notable successes for Civil Aerospace, with record levels of widebody engine deliveries, expanding the installed fleet and generating positive service revenue growth. The Trent XWB-97 and the Trent 7000 achieved full flight certification during the year and the Trent 1000-TEN entered into service. The Trent XWB-84 saw much improved OE economics and has achieved over 1.2 million flying hours in service with unprecedented levels of reliability. These milestones have been achieved against a backdrop of capacity constraints, primarily for blade manufacture and test beds, which have been exacerbated by a number of in-service engine issues relating to the serviceable life of a small number of parts on the Trent 1000, which have led to significant customer disruption, and on the Trent 900. Investments have been made in facilities and people to minimise the disruption caused to our customers and to develop longer-term solutions.

## Financial overview

£m	2017	2016	Change	Organic change
<b>Order book*</b>	<b>70,164</b>	<b>72,008</b>	<b>-3%</b>	<b>-3%</b>
<b>Engine deliveries</b>	<b>683</b>	<b>649</b>	<b>+5%</b>	<b>+5%</b>
<b>Underlying revenue</b>	<b>8,023</b>	<b>7,067</b>	<b>+14%</b>	<b>+12%</b>
Underlying OE revenue	3,818	3,357	+14%	+12%
Underlying services revenue	4,205	3,710	+13%	+12%
<b>Underlying gross profit</b>	<b>1,192</b>	<b>1,185</b>	<b>+1%</b>	<b>-2%</b>
Gross margin %	14.9%	16.8%	-190bps	-220bps
Commercial and administrative	(373)	(353)	+6%	+5%
Research and development cost	(412)	(568)	-27%	-29%
Joint ventures and associates	113	103	+10%	+6%
<b>Underlying operating profit</b>	<b>520</b>	<b>367</b>	<b>+42%</b>	<b>+34%</b>
<b>Underlying operating margin%</b>	<b>6.5%</b>	<b>5.2%</b>	<b>+130bps</b>	<b>+100bps</b>

\*2016 year end comparative - restated for a methodology change – See page 9

## Total underlying revenue

Total underlying revenue rose 12% to £8,023m, with both OE revenue of £3,818m (2016: £3,357m) and services revenue of £4,205m (2016: £3,710m) up 12%. The rise in OE revenue reflected record levels of widebody engine deliveries, with growth in Trent XWB-84 engine sales, to support the Airbus A350 programme ramp-up, a significant contributor.

Higher services revenues were driven by both increased engine flying hours and higher time and material activity. Overall large engine flying hours increased by 12% to 12.6m. This reflects a 22% increase in flying hours from the in-production Trent engine fleet partially offset by a decrease of 12% from the legacy fleet of engines, the Trent 500 and 800 and RB211s, which are no longer in production.

For business aviation, while OE sales were 26% lower, reflecting a 32% reduction in engine sales as airframe production transitioned to competitor-powered programmes, there was a 10% increase in services revenues from continued fleet growth and consistently high CorporateCare coverage. Overall V2500 revenues increased 6% driven by higher maintenance, repair and overhaul activity. Service revenue from V2500 increased 13% led by higher maintenance activity. V2500 OE module sales continued to reduce but revenue from flying hours remained stable.

## Underlying operating profit

Underlying operating profit increased to £520m, up 34% (2016: £367m). Increased gross margin contributions were generated by higher deliveries of link-accounted Trent 700 engines, increased flying hours in growing widebody and business aviation fleets and increased sales of spare parts. This was partially offset by the decline in business jet engine OE sales.

Given the performance of our in-service fleets continued to evolve, as we do every year, we have updated our forward estimates of revenues and costs across our long-term contracts. While this included some favourable effects, such as increased utilisation and reduced servicing costs across our business aviation fleet, it also required the inclusion of higher costs for additional maintenance activity for the Trent 1000 and Trent 900 fleets and increased customer support to alleviate the impact of limited engine availability. In total, the contract accounting adjustments created a £18m headwind (2016: £90m benefit) which included a £148m charge (2016: £98m charge) for technical cost (including certain costs relating to the Trent 1000 and Trent 900 in-service issues), a £113m (2016: £217m) benefit from life cycle cost improvements and a £77m benefit from a customer credit rating change, offset by other charges of £60m (2016: £64m charge) largely relating to operational changes. The profit was also impacted by the non-repeat of the £53m release in 2016, following accounting and legal review, of an accrual relating to the termination in prior years of intermediary services. Gross margin from spare engine sales to joint ventures contributed £67m (2016: £97m).

Investment in self-funded R&D rose by £50m largely reflecting increased investment in the development of a number of new engine types which we successfully progressed, plus ongoing investment in product improvements to our existing portfolio. In 2017 this focused on further enhancing in-service durability, with a notable focus on the longer-term solutions to the Trent 900 in-service engine issues, and fuel burn efficiency as we look to deliver on our customer commitments. This was more than offset by an increase in R&D capitalisation which rose to £328m (2016: £85m), largely reflecting the stage of capitalisation of a number of development programmes. It also reflects a change we have made to better align with European peers and best practice, to the point at which we start capitalising development costs to reflect current engine programmes reaching technical maturity earlier in the development cycle than has been the case historically. This resulted in additional development costs of £83m being capitalised. Contributions from risk and revenue partners decreased to £39m (2016: £63m). Overall the expensed R&D charge fell to £412m in 2017 from £568m in 2016. Higher restructuring provisions contributed to the 5% increase in commercial and administrative costs.

### **Trading cash flow**

Trading cash flow at Civil Aerospace of £38m was unchanged year on year. This reflected increased flying hour receipts from the growing widebody fleet and higher spare parts sales, offset by an increased outflow from higher deliveries OE widebody engines and the higher Trent 1000 accelerated maintenance activity. The average cash deficit on widebody engines remained flat at £1.6m per engine, reflecting greater volumes of discounted Trent 700 and some temporary pricing headwind on Trent 900, offsetting strong improvement on Trent XWB-84, where the cash deficit per engine reduced by 37%, underpinning our confidence of further cost reduction and economic improvement. Total cash costs incurred in the year for in-service engine issues on the Trent 1000 were £119m (2016: £45m) and £51m (2016: £45m) on the Trent 900.

The increase in self-funded R&D investment mentioned above, together with higher capital expenditure for additional production capacity and for engines to support the growing fleet, were offset by good working capital performance on cash collections from a number of key customers at the end of the period. This benefit helped offset the growth in inventory to support the continuing widebody engine ramp in 2018.

### **Additional financial information and IFRS 15 adoption impact**

Further details on revenue, profit and balance sheet for Civil Aerospace results can be found on pages 24 to 25. In advance of the adoption of IFRS 15 from January 2018, a comparison of the 2017 financial results under IFRS 15 to those under the current basis, together with a commentary on the key differences between the two approaches can be found on pages 27 to 29.

### **Order book**

Order intake in 2017 was £10.5bn (2016: £14.1bn including a £2.1bn uplift from a change in the long-term USD planning rate) with orders placed for 185 widebody engines. The closing order book is £70.2bn (2016: £72.0bn) and includes orders for over 2,500 widebody engines. Orders placed during the year included 119 engines for Airbus platforms including the A350 XWB and A330neo as well as 66 engines for Boeing 787 Dreamliners.

## **Operational and strategic review**

The business has made significant progress in the year, despite capacity constraints on parts and test beds, achieving a record level of large engine production and deliveries while also focusing on minimising the impact on customers from in-service issues on the Trent 1000 and Trent 900 fleets.

### **Engineering and R&D**

Significant milestones have been achieved in each of the three new large engine programmes on their progression towards entry into service. Two new engines achieved certification: the Rolls-Royce Trent 1000 TEN engine and the Trent XWB-97. The Trent 1000 TEN entered service on the Boeing 787-9 in November and the Trent XWB-97 powering the Airbus A350-1000 entered into service in early 2018. In October, Trent 7000 engines powered the first test flight of the Airbus A330neo and the programme remains on schedule for entry into service in mid-2018.

The business continues to invest in developing future technologies which will be key to winning positions on next generation platforms for both large engines and for future business jet programmes. Good progress has been made on new engine architecture demonstrator programmes in 2017. The Advance3 demonstrator successfully completed initial ground test runs and the UltraFan Power Gearbox successfully completed a high power test run to a record 70,000 hp.

In November the business announced that it will be developing the E-Fan X hybrid electric demonstrator in collaboration with Airbus and Siemens. This development reflects the growing importance of electrification to the long-term future of the industry.

### **Operational progress**

Civil Aerospace has invested in both its facilities and in building the skilled workforce necessary to support the continuing ramp-up in widebody engine production. These actions enabled the business to deliver a record 483 widebody engines in 2017 (2016: 357), up 35%, despite challenges caused by in-service issues.

In June, £150m investment in facilities was announced with the majority going to new testing facilities for large engines in Derby. We also opened a new Trent XWB assembly line in Dahlewitz to complement the existing one in Derby. Together these two facilities will enable us to deliver seven Trent XWB engines a week by mid-2018.

The new fleet support facility in Tyne and Wear became operational, allowing the early closure of an older facility to take place in 2018. In addition, legacy supply chain facilities in Ansty and Sunderland were exited during 2017.

### **In-service fleet performance**

Our large engine fleet has continued to grow, with over 4,400 engines in active service at the end of 2017, up 7% on 2016. Invoiced flying hours from in-production Trent engines rose 22% and total invoiced flying hours from service agreements across all our widebody, business aviation and regional jet engines were 16.7 million, an 8% increase on 2016. The Trent 700, which constitutes 36% of our installed widebody engine fleet, continued to perform well in service achieving a dispatch reliability of 99.9%.

We celebrated a number of milestones in the year including the Trent XWB-84 achieving over 1.2 million flying hours with unprecedented levels of reliability (99.9% dispatch reliability).

We have, however, experienced an increased level of activity managing in-service issues on two engine programmes in 2017, the Trent 1000 and Trent 900, caused by the lower than expected durability of a small number of parts. In the first half of the year we took £59m of charges related to technical issues with the in-service fleet, the largest component of which related to the Trent 1000. Since then we have continued to progress our understanding of the technical issues impacting compressor rotor blades, intermediate and high pressure turbine blades for the Trent 1000 and also high pressure turbine blades for the Trent 900, together with the consequential operational impact on our customers. This has been a dynamic situation and we are managing these issues through a proactive engine maintenance programme. This has required increased short-term support including both on-wing and shop visit intervention, which has resulted in disruption for some of our customers.

We have grown our Trent 1000 MRO capacity since an issue with the intermediate pressure turbine blade was first identified, including doubling the number of 'lines' available in the UK, developing a dedicated 'shop' in our SAESL facility in Singapore and using lean methods to reduce turn-around times. We continue to make solid progress with longer-term solutions, largely through the re-design of affected parts, and we expect these to be fully embodied in the Trent 1000 fleet by 2022. Reducing disruption to our customers remains our top priority. The Trent 1000 TEN engine, the latest variant of the Trent 1000, includes a variety of improvements that help deliver greater capability, durability and efficiency. It is, however, possible that a population of early Trent 1000 TEN engines may benefit from proactive maintenance to embody re-designed parts that weren't available at the point of production. On the Trent 900, an extended life turbine blade is being rolled out into the current fleet. Further re-designs are underway and will be available in 2020.

Total charges of £227m (2016: £98m) were recognised in the income statement in relation to accelerated maintenance activity for the Trent 1000 and Trent 900 in 2017 and £170m (2016: £90m) in our cash flow. Based on our current estimates, in 2018 the anticipated annual cash impact in respect of both the Trent 1000 and the Trent 900 is expected to broadly double from the total cash cost in 2017 of £170m and reach a peak in 2018, as maintenance activity intensifies. It is then expected to fall by around £100m in 2019. The majority of the work will be undertaken in 2018 and 2019 although it is expected to be fully complete by 2022. All of these costs are included in our cash flow guidance for 2018 and beyond.

### **Developing the service offerings**

As the engine base matures and flying hours continue to grow, the business has broadened its range of long-term service packages to meet the needs of an increasingly diverse customer base.

In June, the Airline Aircraft Availability Centre was opened in Derby. The Centre uses industry-leading data analytics to proactively plan engine operations and maintenance and complements the existing global network of Customer Service Centres working to provide in-depth expertise in their local markets.

The service network has continued to evolve with Air France/KLM joining the CareNetwork for Trent XWB engines. The global network of Authorised Service Centres for business aviation aircraft now totals 74.

We have sought to develop both physical and digital infrastructure for aftermarket services through a number of initiatives. We introduced the CareStore as a customer gateway to the full range of digitally-enabled services, supporting more informed decisions. Online apps were launched for both commercial and business aviation customers to provide better insight into their engines to help optimise performance and provide real time service information.

We continued to develop our services for our lessor customers and in January 2018 we launched LessorCare, a pioneering new service tailored to their needs, and successfully signed three customers up in the first wave. Total service revenues of £4.2bn in 2017 now represent 52% of Civil revenues and 28% of Group revenues. Over the next few years we expect continued aftermarket revenue growth as we build towards a 50% plus share of the installed widebody passenger market and service revenues from Civil become a greater proportion of our Civil and group revenues.



## Defence Aerospace overview

The Defence Aerospace business had another solid year. Original Equipment (OE) production focused on executing under long term contracts in Transport & Patrol as well as delivering technology to improve fuel efficiency for legacy fleets. In Combat, as well as increasing production for the LiftSystem, the joint venture announced with Kale in Turkey positioned us well to offer an indigenous engine solution for the TF-X fighter jet.

A number of core US service contracts were renewed, covering over 3,000 engines, and an agreement with Aviall, a Boeing company, significantly improved the spares distribution channel for AE defence engines. There were also additions in the UK and India to further enhance our Service Delivery Centre network. The facility modernisation programme in Indianapolis met all of its 2017 milestones with targeted cost reductions also on track. Finally we continued to make progress on the development of next generation technologies across our portfolio to ensure we can continue to offer our customers increased performance and capability for their operations.

## Financial overview

£m	2017	2016	Change	Organic change
<b>Order book*</b>	<b>3,382</b>	<b>4,104</b>	<b>-18%</b>	<b>-14%</b>
<b>Engine deliveries</b>	<b>605</b>	<b>661</b>	<b>-8%</b>	<b>-8%</b>
<b>Underlying revenue</b>	<b>2,275</b>	<b>2,209</b>	<b>+3%</b>	<b>-1%</b>
Underlying OE revenue	966	890	+9%	+4%
Underlying services revenue	1,309	1,319	-1%	-4%
<b>Underlying gross profit</b>	<b>575</b>	<b>564</b>	<b>+2%</b>	<b>-2%</b>
Gross margin %	25.3%	25.5%	-20bps	-20bps
Commercial and administrative	(130)	(124)	+5%	+2%
Research and development charge	(78)	(71)	+10%	+8%
Joint ventures and associates	7	15	-53%	-53%
<b>Underlying operating profit</b>	<b>374</b>	<b>384</b>	<b>-3%</b>	<b>-7%</b>
<b>Underlying operating margin %</b>	<b>16.4%</b>	<b>17.4%</b>	<b>-100bps</b>	<b>-100bps</b>

\*2016 year end comparative - restated for a methodology change – See page 9  
Defence order book opening balance has been restated by £(441)m in 2016

## Underlying revenue

Underlying revenue of £2,275m was broadly flat on the prior year on a constant currency basis. OE revenues increased 4% through higher Transport & Patrol volumes, partially offset by lower Combat sales following the completion of Middle Eastern delivery contracts in early 2017. Service revenues were down 4%, reflecting slightly lower Long Term Service Agreements (LTSA) revenue related to the 2016 retirement of the UK MoD Gnome-powered Sea King fleet and reduced demand for spare parts in India in particular. We did however see increased overhaul activity in the US for the F-35B fleet and for the Typhoon fleet in Saudi Arabia.

## Underlying operating profit

Gross profit of £575m was 2% lower than prior year reflecting lower LTSA margin improvements of £68m (2016: £82m), largely due to lower cost savings compared with 2016 on the Eurofighter Typhoon contract, and lower spare parts volumes. These were mostly offset by the non-repeat of £31m of one-off costs for the TP400 programme.

Overall the R&D charge of £78m (2016: £71m) was slightly higher and included ongoing future programme development across our portfolio focused on the combat and transport markets. Restructuring costs included within C&A were £14m higher due to the non-repeat of the one-off benefit in 2016 following the closure of the Defence Aerospace facility at Ansty. As a result of these changes, underlying operating profit of £374m was 7% lower than the prior period.

During the year, the Defence Aerospace order book was restated by £(441)m to reflect a number of assumption changes relating to certain historical orders and long-term contracts including revised scope and lower expectations of price escalation and delivery volumes. After order intake of £1.8bn, the order book closed at £3.4bn.

## **Operational and strategic review**

Activity with key customers included major contract renewals with the US Department of Defense supporting engine fleets on aircraft such as the C-130, V-22 Osprey and T-45. Together these cover around 3,000 engines and the orders taken in 2017 for over \$1.4bn provide good visibility on a substantial portion of aftermarket revenues for the next 5 years. Internationally the business signed its first OE export order with the Japanese Self-Defense Force to power their new V-22 Osprey fleet and also secured additional MRTT engine contracts.

Operationally, the Defence business focused on delivering on its long-term contracts for core transport programmes. In Combat, LiftSystem production for the F-35B Lightning II increased, with the current in-service fleet performing well. The aircraft made its first international operational deployment with the US Marine Corps to Japan, and its first UK-based deployment for the MoD is planned for 2018. EJ200 production was lower following completion of the Saudi Typhoon contract in 2016, although there is the expectation of incremental orders from the State of Qatar following the signing of a contract to purchase 24 aircraft in December.

Technology inserts for the Hercules C-130 legacy fleet met operational performance expectations and demonstrated excellent reliability and fuel efficiency in extended hurricane operations during major US storms in 2017. This helped generate good international interest with a potential first export order currently being evaluated. Defence continued with its strategy of moving into adjacent products to deepen relationships with existing customers, identifying an additional platform opportunity for infra-red suppressors installed on the MH-47 helicopter to be fitted onto C-130 gunships.

The business continued with the modernisation programme of its manufacturing and technology research plant in Indianapolis with all key 2017 milestones achieved on time. The plant's first turbine production cell came on stream in March and a second is nearing completion. The modernisation will help drive meaningful productivity benefits and reduce operational overheads by 2020. We also announced further rationalisation of our operational footprint with the closure of our repair and overhaul facility in Oakland, California by 2020.

A joint venture agreement with Turkish industrial firm Kale Group positions us well to develop an indigenous combat engine for Turkey targeting the TF-X fighter jet. Development work has also continued on the Anglo-French Future Combat Air System (FCAS) feasibility programme, together with investment in future technologies to position us for new programme opportunities over the next decade.

Strategic aftermarket initiatives looked to deepen customer relationships and distribution capability, including an enhanced spares supply contract with Aviall, a Boeing company, covering all defence variants of the AE engine fleet. This multi-year contract is expected to significantly improve availability and logistics, while broadening international opportunities. In addition, two further Service Delivery Centres were opened in Lossiemouth and Bangalore as we continue to find ways to enhance our offering with core customers, helping with preventative maintenance and maximising on-wing availability.

## Power Systems overview

Power Systems core business is the design, manufacture and servicing of reciprocating engines including diesel, gas and hybrid/electrical solutions, propulsion systems and distributed power generation plants. It has a significant installed engine base across a diverse range of end markets.

In 2017, strengthening demand in key end markets combined with a clear focus on operational improvements through the RRPS 2018 transformation programme. This enabled the business to deliver a strong performance achieved against the background of greater operational efficiencies and a more balanced annual production cycle. Revenue grew slightly and helped deliver significant profit and cash flow growth.

Under new leadership the business was able to achieve a material reduction in product variants and greater R&D discipline while targeting low-emission technologies. There has also been a move to develop more comprehensive and connected power solutions leveraging digitalisation as an enabler of service penetration and a growing competitive advantage. Power Systems also sought to expand its geographic reach with manufacturing and assembly partnerships in India and in the core growth market of China.

## Financial overview

£m	2017	2016**	change	organic change
<b>Order book*</b>	<b>2,196</b>	<b>2,035</b>	<b>+8%</b>	<b>+4%</b>
<b>Underlying revenue</b>	<b>2,923</b>	<b>2,655</b>	<b>+10%</b>	<b>+3%</b>
Underlying OE revenue	1,961	1,810	+8%	+1%
Underlying services revenue	962	845	+14%	+6%
<b>Underlying gross profit</b>	<b>842</b>	<b>702</b>	<b>+20%</b>	<b>+12%</b>
Gross margin %	28.8%	26.4%	+240bps	+240bps
Commercial and administrative	(331)	(335)	-1%	-7%
Research and development charge	(177)	(177)	-	-6%
Joint ventures and associates	(4)	1	-500%	-400%
<b>Underlying operating profit</b>	<b>330</b>	<b>191</b>	<b>+73%</b>	<b>+61%</b>
<b>Underlying operating margin %</b>	<b>11.3%</b>	<b>7.2%</b>	<b>+410bps</b>	<b>+410bps</b>

\*2016 year end comparative - restated for a methodology change – See page 9

\*\* 2016 figures for underlying gross profit and commercial and administrative costs have been restated as a result of other operating income previously reported in 'cost of sales' being reclassified as 'other commercial and administrative income' to ensure consistent treatment with 2017.

## Underlying revenue

Underlying revenue of £2,923m increased by 3%. Original Equipment revenues grew 1% while service revenues increased 6%. Commodity-related markets, such as mining and oil & gas saw a strong recovery, as did construction and agriculture. Power Generation products enjoyed good demand from China and for US data centres, but was more subdued elsewhere, as was the yacht market for much of the year. The service business broadened its market reach with good interest in our reconditioning service offering and from US customers.

## Underlying operating profit

Overall, gross margins increased 240 bps to 28.8% reflecting improved product mix, including from service revenues and programme applications, operational gearing and from higher volumes. An improved balance of production between the first and second half of the year also helped to achieve better factory utilisation. The actions taken as part of the RRPS 2018 programme on direct material costs also contributed to the improved gross margin.

A more focused approach to R&D drove a 6% reduction to £177m. Commercial & administrative costs reduced 7% to £331m reflecting cost reduction activities in the year. Overall underlying operating profit which increased strongly to £330m (2016: £191m).

## Operational and strategic review

Power Systems' customers span a range of end-markets providing significant diversity. The strong performance in 2017 reflected growing demand in a number of key end-markets as the overall environment improved. Engine production increased principally due to demand for the core Series 4000 products, large engines and rail power packs. The business was also successful in greater smoothing of the sales and production cycle over the year, reducing the proportion of sales and production activity in the fourth quarter, which has historically been abnormally high.

There was growing order interest through the year, particularly naval and governmental customers with a stronger order book in the second half. The medium speed business announced two notable power station orders from Bangladesh. Manufacturers active in the construction and agriculture market increased orders in advance of new EU emissions regulations due to come into force at the start of 2019. The first delivery of the new S4000 Marine Natural Gas Engine which is IMO Tier III compliant, was made to the Dutch ferry operator Doeksen. Gas systems sales in Marine and Power Generation now make up over 14% of revenues from the S4000 range.

The business entered into new segments such as excavators with products meeting the latest emissions standards driven by orders from market leaders KATO and JCB. A project agreement was signed with agricultural machinery manufacturer Claas for the annual supply of around 5,000 Series 1000-1500 engines.

Power Systems also sought to grow its share of its engine service opportunity. This included the REMAN product, where engines are reconditioned and restored to the latest MTU specification and come with an as-new warranty package, and which generated strong interest. Customer Care Centres were established in key time zones to greatly enhance technical support responsiveness to customers' critical requirements and applications were launched to deepen customer service and dialogue. Over time, the business will look to develop more comprehensive power solutions which will offer higher-value and digitally connected products which will deepen the customer experience. An initial step was the business's first long-term availability contract signed with Hitachi Rail for their UK Intercity programme, covering the period to the early 2040s; and Power Systems sees significant opportunity to develop similar long term service offerings for other customers.

A reinvigorated leadership team under the new CEO, Andreas Schell, helped drive the RRPS 2018 restructuring programme. This was a key contributor to the strong performance in 2017, delivering significant operational improvements as the business pursued greater efficiencies and focus across both R&D and production. This delivered a 20% reduction in product variants and was combined with actions to improve material costs, quality control, inventory levels and a footprint reduction. Greater digitalisation within the development programmes helped to reduce the time to product launch, including the online monitoring of the ramp-up fleet and greater collaborative working.

Agreements made in India and China are intended to broaden the production capability in lower-cost locations closer to core end markets. These included the official registration of a 50/50 joint venture with Guangxi Yuchai Machinery in China. The agreement will enable localised production of the MTU Series 4000 diesel engines under license, which comes on-stream in early 2018 and is part of the China growth strategy. An agreement was also signed with Garden Reach Shipbuilders & Engineers Ltd for final assembly in India of Series 4000 naval engines, and we are looking to secure additional partnerships for end markets such as power generation.

R&D programmes have focused on the strategic priorities addressing new technologies, alternative fuels and system-based solutions, reflecting the structural shift away from traditional diesel engines expected over the next decade. This included strengthening the gas engine portfolio, reflecting greater demand from better infrastructure and availability within PowerGen, Industrial and Marine segments. This complements the investment in electrification to expand our hybrid capabilities and further development of micro-grid solutions. A co-operation agreement with G+L innotec for electrical-assisted turbo charging technology is part of a programme to build a range of advanced electrical capabilities as a basis for development of future hybrid and electrical drive solutions.

## Marine overview

With the average Brent crude oil price remaining below US\$55/barrel for the third consecutive year, our Commercial Marine business continued to see substantially reduced activity levels in its historically important offshore market, but saw opportunities within the merchant sector. The Naval business had a successful year with new projects from existing core clients such as the UK and US navies and from new geographies.

As a result of the weak market environment, the business focused on executing on its restructuring programmes, reducing its fixed cost base, including significant headcount reduction, and closing non-core facilities. At the same time it is repositioning itself with product development such as permanent magnet thrusters, investing in future technologies as the industry moves to greater electrification and exploring the growing potential for remote vessel operations and autonomous shipping.

It was announced after the year-end that our Commercial Marine operations would be subject to a strategic review in 2018, including the potential for sale, while the Naval operations would be integrated into an enlarged Defence business unit.

## Financial overview

£m	2017	2016	change	organic change
<b>Order book*</b>	<b>814</b>	<b>988</b>	<b>-18%</b>	<b>-15%</b>
<b>Underlying revenue</b>	<b>1,077</b>	<b>1,114</b>	<b>-3%</b>	<b>-9%</b>
Underlying OE revenue	566	631	-10%	-15%
Underlying services revenue	511	483	+6%	-
<b>Underlying gross profit</b>	<b>225</b>	<b>236</b>	<b>-5%</b>	<b>-9%</b>
Gross margin %	20.9%	21.2%	-30bps	-20bps
Commercial and administrative	(204)	(222)	-8%	-13%
Research and development charge	(46)	(41)	+12%	+7%
Joint ventures and associates	-	-	-	-
<b>Underlying operating loss</b>	<b>(25)</b>	<b>(27)</b>	<b>-7%</b>	<b>-15%</b>
<b>Underlying operating margin %</b>	<b>-2.3%</b>	<b>-2.4%</b>	<b>-10bps</b>	<b>-10bps</b>

\*2016 year end comparative - restated for a methodology change – See page 9

## Underlying revenues

Underlying revenues were down 9% at £1,077m, reflecting declining OE activity, with weakness in both offshore and cargo-related merchant markets. Service revenues were stable, though off a low base in 2016, and there was a notable improvement in Naval revenues, particularly in the second half. The 15% decline in OE revenues resulted in service revenues rising to 47% of the total (2016: 43%). By segment, Commercial Marine was down 14% to £805m (2016: £875m) and Naval was up 10% to £272m (2016: £239m).

## Underlying operating loss

Despite the 9% decline in underlying revenues there was a £2m reduction in the underlying operating loss for the year to £25m (2016: £27m), helped by the greater proportion of higher margin service revenues and reflecting the positive impact of cost cutting programmes. R&D spend was broadly flat at £46m, with the focus on developing ship intelligence capabilities as well as on new product development. C&A costs of £204m were 13% lower, demonstrating the progress made in reducing both headcount and fixed costs, together with a significant reduction in inventory which helped mitigate the scale of cash outflows.

## Operational and strategic review

Lower activity within Commercial Marine reflected the weak market environment as deep water exploration activities remained at depressed levels. While OE activity continued to decline, the business was encouraged by the signing of the first offshore service contract since 2015 and a long-term service agreement reached for azimuth thrusters. There was also activity across the merchant sector including Norwegian ferry operator contracts for new gas engines and thrusters along with further auto-crossing system product sales.

Within the Naval business a landmark contract was signed to supply the US coastguard's largest shipbuilding programme, initially covering up to 11 vessels with a range of propulsion and related technologies. In addition, the MT30 gas turbine continued to demonstrate its attractiveness as a naval engine choice with its selection by the Republic of Korea for three Daegu type frigates.

Work continued with a number of customers who had previously selected the MT30 including factory acceptance testing with the Italian Navy's LHD vessel and in the UK both on the Royal Navy's Type 26 frigate programme and the two new Aircraft Carriers. HMS Elizabeth II completed successful sea trials and preparation for the first run of the HMS Prince of Wales power plants is scheduled for 2018. The team also announced a concept autonomous defence vessel capable of a range of single role naval missions, drawing on the expertise across power and propulsion and autonomous tools.

The main operational focus across the Marine business was the continued effort to reduce fixed costs to help mitigate the impact of the weaker offshore market. The restructuring programme announced in November 2016 achieved its target of £45-50m of annualised cost savings. This was helped during the year through further rationalisation of back office functions, together with the closure of the Shanghai assembly facility.

Investment of around £20m in the year was made in a state-of-the-art production and test facility in Rauma, Finland which will deliver significant capabilities for what is a growing market opportunity.

The Marine business has also sought to capitalise on the broader shift from mechanical to electrical and digital technologies, both within its existing product range and also through investment in opportunities for integrated ship systems and remote or autonomous vessels. The launch of a new energy management solution and the first ever Marine availability-based contract reflects the growing potential in this area. Third party funding was secured to support R&D for land-based control centres and a Fleet Management Centre was established for remote optimisation of ship operations. Rolls-Royce successfully demonstrated this new technology by partnering with global towage operator, Svitser, including the first trial of a remotely operated commercial vessel that took place in Copenhagen harbour.

## Nuclear overview

The business plays a key role in the UK's submarine programme, acting as the Technical Authority, sole supplier and provider of through-life support for all submarine nuclear propulsion systems (representing over 75% of sales). This year work principally focused on the Astute and Dreadnought classes with significant progress made in operational and delivery performance as part of a multi-year improvement programme and increased investment in the Raynesway, Derby manufacturing facilities.

The Civil Nuclear business achieved key milestones on large retrofit contracts for safety-critical control systems in Finland and France. Service contracts were signed with nuclear utility customers across Europe, Canada and China while additional investment was made into the small modular reactor (SMR) programme where the UK Government announced a viability study covering a number of technologies.

## Financial overview

£m	2017	2016	change	organic change
<b>Order book*</b>	<b>1,967</b>	<b>1,825</b>	<b>+8%</b>	<b>+7%</b>
<b>Underlying revenue</b>	<b>818</b>	<b>777</b>	<b>+5%</b>	<b>+4%</b>
Underlying OE revenue	383	354	+8%	+6%
Underlying services revenue	435	423	+3%	+2%
<b>Underlying gross profit</b>	<b>133</b>	<b>121</b>	<b>+10%</b>	<b>+7%</b>
Gross margin %	16.3%	15.6%	+70bps	+50bps
Commercial and administrative	(72)	(70)	+3%	+1%
Research and development charge	(23)	(6)	+283%	+267%
Joint ventures and associates	-	-	-	-
<b>Underlying operating profit</b>	<b>38</b>	<b>45</b>	<b>-16%</b>	<b>-18%</b>
<b>Underlying operating margin %</b>	<b>4.6%</b>	<b>5.8%</b>	<b>-120bps</b>	<b>-120bps</b>

\*2016 year end comparative - restated for a methodology change – See page 9

## Underlying revenue

Underlying revenue rose by 4% driven mainly by increased production activity in support of the Dreadnought class build programme, together with greater activity in Civil new build contracts and field services. Submarine revenues grew 3% to £633m while Civil Nuclear revenues grew 9% to £185m. There was a strong second half performance, reflecting phasing within the submarine programmes.

## Underlying operating profit

Gross margin was broadly flat, reflecting a combination of increased activity offset by additional costs incurred to ensure higher levels of delivery performance for the key submarine programmes. The R&D charge was £17m higher than 2016 as the SMR programme moved to concept design activity and did not benefit from the one-off change in treatment of R&D credits (2016: £7m credit). As a result, underlying operating profit was £38m, £7m lower than the previous year.

## **Operational and strategic review**

The Nuclear business focused on improving cost-control, sustainable quality and on-time delivery for the key submarine programmes. As part of an overall regeneration of the submarine business capability, a significant number of new manufacturing technologies and systems were introduced. These have helped to drive significant improvements in delivery of reactor plant components into the Astute programme.

Investment was made into new manufacturing facilities, people and infrastructure at Raynesway, Derby. This includes a planned expansion of the Primary Component Operations factory, principally in support of the new Dreadnought programme, where production work is increasing in support of the build programme. The expanded facilities will help develop and manufacture the new generation PWR3 reactor plant as well as support the current submarine fleet.

In addition, the contract to deliver the nuclear propulsion system for HMS Agamemnon, the sixth of the new Astute class submarines was signed during the year. Steady progress was also made towards the establishment of a delivery alliance for the Dreadnought class which should provide greater programme and cost control benefits to help meet the affordability challenges for our MOD customer.

The Civil Nuclear business saw good growth during the year and is well positioned on new build projects. In the UK, activity was centred on Hinkley Point C, with a number of projects underway including the successful completion of the Early Contractor Involvement (ECI) phase for the design of Heat Exchangers. We also signed the main contract to complete detailed design work and begin manufacturing and equipment delivery. There was progress on the supply and delivery of both Waste Treatments systems and Ultimate Diesel Generators under similar ECI arrangements.

Internationally, the Civil Nuclear business achieved key milestones on schedule, as part of its long-term contracts to retrofit and upgrade safety-critical control systems at Loviisa, Finland and for EDF's fleet of nuclear reactors in France. The business renewed a contract with EDF to provide long-term support and secured a contract for the partial modernisation of safety-critical control systems on all 34 units of its 900 MW French fleet.

At Fennovoima's new build plant at Hanhikivi, Finland, due for completion in 2024, the business was selected as preferred bidder to supply instrumentation and controls. The business strengthened its position in China with new commercial agreements signed with CTEC (CGN) and secured orders for the current new build programme at Tianwan 5 and 6. In Canada, the contract with Bruce Power to help improve through-life operational efficiency will utilise cutting edge digital analytical tools developed from innovations in the business and based on capability within Civil Aerospace.

Rolls-Royce welcomed the UK Government's decision to set up an Expert Finance Panel to assess the viability of technology options including short-term deployable SMRs and will participate in this review in 2018. The announcement in November of a technical feasibility study with state-owned Jordan Atomic Energy Commission (JAEC) for the construction of a Rolls-Royce SMR highlights the international potential, including growing interest from major markets in the Commonwealth and Middle East.



## Civil Aerospace - Additional financial information

### Revenue

Overall, **underlying revenue** for Civil Aerospace rose 12% to £8.0bn, with OE revenue of £3.8bn (2016: £3.4bn) up 12% and services revenue of £4.2bn (2016: £3.7bn) also up 12%. The rise in OE revenue reflected record levels of widebody engine deliveries, with growth in Trent XWB-84 engine sales, to support the Airbus A350 XWB programme ramp, a significant contributor.

£m	2017	2016	Change	Organic change
<b>Original Equipment</b>	<b>3,818</b>	<b>3,357</b>	<b>+14%</b>	<b>+12%</b>
<i>Large engine: linked and other</i>	1,895	1,604	+18%	+18%
<i>Large engine: unlinked installed</i>	1,103	742	+49%	+49%
<i>Business aviation</i>	598	757	-21%	-26%
<i>V2500</i>	222	254	-13%	-13%
<b>Services</b>	<b>4,205</b>	<b>3,710</b>	<b>+13%</b>	<b>+12%</b>
<i>Large engine</i>	2,626	2,289	+15%	+15%
<i>Business aviation</i>	527	452	+17%	+10%
<i>Regional</i>	343	342	-	-5%
<i>V2500</i>	709	627	+13%	+13%

Original equipment revenue from *Large engine: linked and other* was up 18% reflecting increased volumes of Trent 700s following a relatively low year in 2016 in which a higher proportion of A330s built were powered by competitor engines, combined with higher deliveries of Trent 900 engines for A380s for Emirates. Sales of spare engines to joint ventures, included in *Large engine: linked and other*, generated revenue of £362m (2016: £288m).

Original equipment revenue from *Large engine: unlinked installed* increased 49%, driven by improved pricing and higher volumes of Trent XWB-84 engines.

The 15% growth in *Large engine* service revenue reflected a 22% increase in invoiced TotalCare flying hours from the growing in-production engine fleet which more than offset the 12% flying hour reduction from mature engine types as older aircraft retired or where customers selected alternative service offerings on transitions. Higher volumes of spare part sales for RB211-535 and Trent 700 engines for time and material overhauls and for TotalCare engines, where not covered by the flying hour payments, also contributed to the revenue increase.

Revenue from *Business aviation* OE engine sales declined for a second year, with a fall in unit volumes of 32%, mostly BR710's, reflecting continued weakness at the higher end of the market coupled with the effect of the transition to newer non-Rolls-Royce powered platforms. Volumes of the newer BR725 engine, which powers the Gulfstream G650 and G650ER, remained broadly stable. Overall, although business aviation OE revenues declined 26%, service revenue increased by 10% reflecting continued fleet expansion, increased CorporateCare penetration and price escalation.

Service revenue from our *Regional* jet engines declined 5%, reflecting further retirements and reduced utilisation of our fleets by North American operators in particular.

On the *V2500* programme, which powers aircraft including the Airbus A320, revenue from OE modules declined 13% as production slowed down further as Airbus transitions to the A320neo, powered by a competitor engine provider. However, *V2500* service revenues of £709m increased by 13% driven by an increased number of overhauls with increased workscope. The contractual payment from IAE based on flying hours was broadly stable, with a reduction in flying hours flowing from retirements of some older aircraft being mitigated by price escalation.

## Contract accounting adjustments

£m	2017	2016
Life-cycle cost improvements	113	217
Change in estimated long-term USD to GBP planning rate	–	35
Technical costs	(148)	(98)
Operational changes	17	(64)
<b>Total contract accounting adjustments</b>	<b>(18)</b>	<b>90</b>

The in-year net charge from long-term contract accounting adjustments included within the gross margin totalled £18m (2016: £90m total benefit, including a £35m benefit from a change to our long-term USD:GBP planning rate).

The benefit from life-cycle cost improvements in 2017 of £113m (2016: benefit of £217m) included a £70m benefit across the portfolio of business aviation contracts following re-assessments of shop visit frequency and costs. Given that the performance of our in-service fleet has evolved over the year, we have increased our estimates for future costs associated with part life limitations, particularly in relation to compressor rotor blades within the Trent 1000 and high pressure turbine blades within the Trent 900. The resulting contract accounting adjustments associated with these shortfalls in part life, combined with additional customer disruption support costs across these two engine programmes, represents £114m (2016: £55m) of the total £148m impact (2016: £98m).

The overall benefit in 2017 from other operational changes was £17m (2016: £64m charge). This comprised a £60m charge driven by changes in the utilisation pattern of several customers' Trent 700, Trent 800 and RB211 fleets, offset by a £77m benefit taken in the first half arising from a change to a customer credit rating risk assessment.

<b>TotalCare net asset</b>		
£m	2017	2016
Cash deficit reversal and profit from new "linked" engines	612	432
Contract accounting adjustments	(18)	90
Foreign exchange	(97)	77
Cash inflows and net other items	(435)	(369)
<b>Total change in TotalCare net asset</b>	<b>62</b>	<b>230</b>

TotalCare net assets increased in 2017 by £62m (2016: £230m) to £2.5bn. This reflected an increase in the overall cash deficit combined with higher "linked" profit driven by increased volumes of new "linked" engines of £612m (2016: £432m), notably the Trent 700.

This increase was offset by adverse contract accounting adjustments taken in the year of £18m (2016: £90m benefit), foreign exchange of £(97)m (2016: £77m) and cash inflows and net other items of £(435)m (2016: £(369)m).

## Contractual aftermarket rights (CARs)

The CARs balance increased by £230m (2016: increase of £169m) to £803m reflecting higher sales of unlinked Trent XWB engines partly offset by price increases and engine unit cost improvements.

## Impact of adopting IFRS 15

### Group underlying results

2017 £m	Current accounting	IFRS 15
<b>Revenue</b>		
Civil Aerospace	8,023	6,613
Defence Aerospace	2,275	2,282
Power Systems	2,923	2,919
Marine	1,077	1,075
Nuclear	818	818
Other	(26)	(25)
<b>Total revenue</b>	<b>15,090</b>	<b>13,682</b>
<b>Operating profit</b>		
Civil Aerospace	520	(330)
Defence Aerospace	374	370
Power Systems	330	331
Marine	(25)	(26)
Nuclear	38	38
Other	(62)	(62)
<b>Total operating profit</b>	<b>1,175</b>	<b>321</b>

IFRS 15 *Revenue from Contracts with Customers* (effective for the year beginning 1 January 2018) replaces the separate models for goods, services and construction contracts currently included in IAS 11 *Construction Contracts* and IAS 18 *Revenue*. The Group will present its 2018 results in accordance with IFRS 15, including 2017 comparatives, on an IFRS 15 basis.

The impact of IFRS 15 on the 2017 underlying results is shown in the tables on this page with further information provided in Notes 1 and 16 to the Condensed Financial Statements. The cumulative impact on net assets as at 31 December 2017 is £(5.2)bn.

As processes and procedures are further embedded during 2018, it is possible that some changes to the impact may result. The adoption of IFRS 15 has had a significant impact on the measurement and the timing of recognition of revenue, most particularly in the Civil Aerospace business. It has no impact on the timing or measurement of the reported cash flows.

The key impacts of adopting IFRS 15 on our Civil Aerospace business are:

- Generally, our contracts with airframers for original equipment and with operators for aftermarket services will not be linked.
- Revenue for original equipment will be recorded at the net amount of consideration receivable with any profit or loss on sale, after recognition of the costs of producing the OE, recorded on delivery.
- Revenue on LTSAs will be recognised as services are performed rather than as the equipment is used as is frequently the case under the current accounting policy. The stage of completion will be measured using the actual costs incurred to date compared to the estimated costs to complete the performance obligation. As we are generally paid on a monthly basis as engine flying hours occur, whilst overhaul and repair activities happen periodically over the term of the LTSA, the recognition of revenue and profit will generally be deferred compared to the current accounting policy and to cash receipts.

In addition, the overall net impact on operating profit of the adoption of IFRS 15 within the Defence Aerospace business was £4m. This comprised a £34m LTSA margin impact which is broadly expected to recur in the short-term, but was offset by a £30m favourable timing benefit from a spares distribution contract, which is not expected to repeat in 2018.

## Impact of adopting IFRS 15 - Civil Aerospace

The tables below provide more detail on the impact of adopting IFRS 15 in Civil Aerospace. We have provided additional information about this business here as it is most significantly impacted by IFRS 15. A more detailed analysis of the impact of adopting IFRS 15 on the other segments are set out in note 16 to the condensed Financial Statements.

£m	Current accounting 2017	IFRS 15 2017	Adjustments
<b>Underlying revenue</b>	<b>8,023</b>	<b>6,613</b>	<b>(1,410)</b>
Underlying OE revenue	3,818	2,905	(913)
Underlying services revenue	4,205	3,708	(497)
<b>Underlying gross profit</b>	<b>1,192</b>	<b>381</b>	<b>(811)</b>
<i>Gross Margin</i>	14.9%	5.8%	
R&D Costs	(412)	(451)	(39)
<b>Underlying operating profit/(loss)</b>	<b>520</b>	<b>(330)</b>	<b>(850)</b>
<i>Underlying operating margin %</i>	6.5%	(5.0)%	

The adoption of IFRS 15 reduces Civil Aerospace underlying revenue and underlying operating profit by £1,410m and £850m respectively.

Underlying OE revenue reduces by £913m, primarily from de-linking the OE and services contracts and no longer capitalising cash deficits. In addition, participation fees paid to airframers are treated as a reduction to revenue where previously presented as a cost.

Underlying services revenue reduces by £497m. This reduction is driven by: a timing change to revenue recognition on TotalCare and CorporateCare long-term contracts where stage of completion has been amended from a flying hours basis to a cost incurred or "input" basis; the de-linking of OE and services contracts; and classification of operator guarantee payments as a reduction to revenue under IFRS 15 where classified as costs under current accounting.

### Underlying revenue by market segmentation

The most significant changes to Civil Aerospace revenue from the adoption of IFRS 15 relate to large engine OE and long-term service contract revenue for both large and business aviation engines.

£m	Current accounting 2017	IFRS 15 2017	Differences
<b>Original Equipment</b>	<b>3,818</b>	<b>2,905</b>	<b>(913)</b>
<i>Large engine</i>	2,998	2,104	(894)
<i>Business aviation</i>	598	582	(16)
<i>V2500</i>	222	219	(3)
<b>Services</b>	<b>4,205</b>	<b>3,708</b>	<b>(497)</b>
<i>Large engine</i>	2,626	2,327	(299)
<i>Business aviation</i>	527	396	(131)
<i>Regional</i>	343	277	(66)
<i>V2500</i>	709	708	(1)

Large engine service revenue is £299m lower under IFRS 15. Under current accounting service revenue is recognised on an engine flying hour basis, i.e. as the engines are being used by the airline operators. The move to recognising revenue on an activity basis (i.e. when Civil Aerospace performs the repairs, maintenance and overhauls) changes the point at which revenue is recognised. This change will typically delay the point at which revenue is recognised under IFRS 15 when compared with the treatment under current accounting and as a result lowers service revenues due to the relatively young age of the fleet with many engines yet to reach their first overhaul.

The nature of the change is the same for CorporateCare® service packages in business aviation. For business jet engines the timing impact may be more pronounced than for large engines as business jet engines are often on wing for many years before requiring an initial overhaul.

### Contract accounting adjustments under IFRS 15

£m	Current accounting 2017	IFRS 15 2017	Difference
Life-cycle cost improvements	113	17	(96)
Technical costs	(148)	(98)	50
Operational changes	17	(68)	(85)
<b>Total contract accounting adjustments</b>	<b>(18)</b>	<b>(149)</b>	<b>(131)</b>

Under current accounting the stage of completion of long-term service contracts is assessed based on flying hours. As set out above, this means that the percentage of completion will usually be lower under IFRS 15 than under current accounting. For linked OE and service contracts, the stage of completion takes into account both OE and flying hour revenues. The consequence of this linkage with the services contract means that the difference between the completion percentage under IFRS 15 and current accounting will be greater. This is because the linked OE revenue is no longer included in assessing the stage of completion. This change in the way the percentage of completion is calculated will impact the level of contract accounting benefit recognised under current accounting in respect of beneficial life-cycle cost margin adjustments by £(96)m from £113m under current accounting to £17m under IFRS 15.

On the other hand, the contract margin adjustment associated with technical costs will be £50m lower under IFRS 15.

The benefit from other operational changes totalled £17m in 2017 under current accounting. This included a £77m benefit arising from a change to a customer credit rating risk assessment on a linked contract where under IFRS 15, with no linkage, there is no benefit in the year.

### Balance sheet adjustments under IFRS 15

The impact of adopting IFRS 15 on the Civil Aerospace balance sheet are summarised below:

£bn	Current accounting 2017	IFRS 15 2017	Difference
Contractual aftermarket rights	0.8	-	(0.8)
Participation fees - intangible	0.4	-	(0.4)
Participation fees - contract asset	-	0.4	0.4
Net contract debtor/(creditor)	2.5	(2.7)	(5.2)
Other	(0.6)	(0.3)	0.3
Risk and revenue sharing agreements	(0.3)	(0.8)	(0.5)
<b>Civil Aerospace net assets (pre-tax)</b>	<b>2.8</b>	<b>(3.4)</b>	<b>(6.2)</b>
Tax			1.1
<b>Civil Aerospace reserves impact (post-tax)</b>			<b>(5.1)</b>

£(5.1)bn of the £(5.2)bn impact to the Group's opening reserves from the adoption of IFRS 15 is driven by Civil Aerospace.

The transition to IFRS 15 requires de-recognition of the contractual aftermarket rights recorded as Intangible Assets under current accounting. As this cost will now be recorded at the point of sale of OE the amortisation previously recorded will cease benefiting the gross profit reported on underlying services revenue.

Under IFRS 15 we regard participation fees as payments to customers that are offset against future revenue from those customers. Therefore, they are recognised as contract assets rather than as intangible assets under current accounting.

In assessing the accounting for the participation fee payments we make to our OE customers, we have also assessed the accounting for up-front payments we sometimes receive from the Group's suppliers under RRSAs to allow them to participate in an engine programme. We have concluded that, consistent with changes to how we will account for participation fees noted above, these receipts should be deferred and recognised against cost of sales over the period of supply. This will also require judgement as to the number of units over which the receipts will be allocated.

The most significant change is to the net contract balance. Other than the reclassification of participation fees and the transition from revenue recognition on an engine flying hours to a cost input basis, the adjustment also represents £(3.2)bn of reversal of profit from contract "linkage." The majority of service contracts are on monthly payment terms based on engine flying hours. As a result, in many cases we will receive cash in advance of incurring costs to support the contract including for overhauls. Under IFRS 15 we will recognise the revenue as costs are incurred, changing the net contract debtor under current GAAP to a net deferred revenue creditor under IFRS 15.