

## PRODUCTION AND LOGISTICS

In production and logistics, we quickly made changes to the number of employees and the provision of materials in response to the changing demand situation in 2015. Numerous measures were implemented as planned, following the decision made in 2014 to optimise the network of sites. Other areas of focus were workplace safety and ergonomics, product and process quality, and efficiency.

**The Cologne plants, Germany** Last year, we began various activities aimed at improving workplace safety and ergonomics at Cologne-Porz, our largest assembly site for production engines. We optimised the provision of materials and redesigned the picking zones. To optimise productivity, we replaced our driverless transport vehicles in the test bay. We expanded the employee information system that we had implemented in 2014. In addition, we stepped up both responsive and preventive measures aimed at improving quality.

**Component manufacture** Relocation of the components produced in the Cologne-Deutz plant has begun – one of the measures to optimise the network of sites. The main activity is the construction of a new 13,500m<sup>2</sup> shaft centre at our Cologne-Porz site, where crankshaft and camshaft manufacture will be located from mid-2016. As part of the detailed planning process, we optimised the layout of machines and the organisation of work using kaizen techniques and also improved their ergonomics.

The Herschbach component plant saw its largest individual capital expenditure project in recent years come on stream in 2015. It involves an ultra-modern processing centre with a pallet storage system in which all kinds of complex engine add-on components can be manufactured very cost-effectively in any batch size.

**The plants in Ulm and Übersee on Lake Chiemsee, Germany** As part of the site optimisation strategy, the Ulm plant is being expanded to become the plant for small production runs, focusing on DEUTZ Customised Solutions products, project business, exchange engines and models which are becoming obsolete. Assembly and order management were relocated to Ulm from Übersee on Lake Chiemsee in 2015. Despite the move, there was an increase in revenue from the reconditioned exchange engine business. Throughput times, which are critical in the Xchange process, were shortened and synergies were leveraged. All other functions will move from Übersee to Ulm in 2017.

**The Zafra plant, Spain** In future, our plant in Zafra (Spain) is to produce the crankcases for engines of up to four litres in addition to the other major engine components already manufactured

there, namely cylinder heads, conrods and gearwheels. In addition to the crankcase for the 2011 engine series, which is now being produced in Zafra rather than inhouse in Cologne, the 2.9 crankcase will also be manufactured in Spain in future.

**The plants in Georgia, USA** In 2015, production of ready-to-install system solutions tailored to customer-specific or segment-specific needs was transferred from Norcross, Georgia to Pendergrass, Georgia. As a result, all activities in the value creation process for the US market are now consolidated at one site. This enables us to leverage synergies between the existing exchange engine production operations in Pendergrass and the relocated assembly line. Processes throughout the logistics chain and in production were optimised at the same time.

**Logistics** Last year, we brought additional suppliers within the scope of our demand and capacity management system which, at the end of 2015, covered some 95 per cent of the total purchasing volume. We extended the relevant procedures and processes in order to improve the stability of supply from critical suppliers. In connection with the closure of the Cologne-Deutz site, we transferred the empties centre back to the inhouse operation in the Cologne area. This secured an additional 35 permanent positions. We worked with a logistics service provider to set up and implement distribution centre structures for deliveries of engines to North America. This is saving both time and costs.

## QUALITY

**Quality is anchored in our corporate principles** The DEUTZ name has always stood for high quality standards in engines. We intend to continue to live up to this reputation.

For this reason, we decided to introduce a zero-error strategy in 2015. Our main aim in pursuing this quality assurance programme is to ensure we always meet our customers' expectations. The idea is to detect errors before they actually occur. And where errors do occur, we have to learn from them quickly in order not to make the same mistakes again. One of the challenges in this context is that we offer a large number of variants and our products are now highly complex.

Last year, we also restructured the product development process in order to greatly improve the methods used and to ensure the quality department is involved from an early stage. Optimised processes for drawing up specifications should help to ensure that customers' wishes are reflected even more accurately in product development.