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## Great leap forward in industrial compressor technology

First MAN hybrid axial compressor goes into testing phase

**MAN Diesel & Turbo SE, Augsburg, and MTU Aero Engines GmbH, Munich, have completed their preparations for the first test run of a new MAN axial compressor at MTU's Munich test stand. This opens the way for the future deployment of a new generation of axial compressors that will enable the economically viable operation of mega processing plants worldwide.**

With support from the German Federal Ministry of Economics and Technology, development teams from MAN Diesel & Turbo and MTU have worked together closely for three years to develop a new generation of axial compressors. This hybrid, which is based on proven, robust industrial design as well as on compressor technology derived from stationary gas turbines and aircraft engines, meets the requirements of future mega processing plants.

In view of economies of scale, process licensors and plant constructors all over the world are of the opinion that future processing plants will be significantly larger than those of today. This applies in various sectors, e.g. the extraction of high-quality fuels from gas, coal and biomass, the capture and storage of the CO<sub>2</sub> generated in large-scale power plants and enhanced oil recovery from oil fields.

The worldwide largest industrial compressors were manufactured by MAN Diesel & Turbo and are currently being installed in two Gas-to-Liquid (GTL) plants. These plants, which will soon go live in Ras Laffan (Qatar) and Escravos (Nigeria), will primarily produce liquid fuels from natural gas.

### **MAN Diesel & Turbo SE**

Stadtbachstraße 1  
86153 Augsburg, Germany  
Postal address:  
86224 Augsburg

### **Group Communications**

For further information,  
please contact:

Michael Melzer  
Tel.: +49 (0) 821 – 322 38 50  
E-Mail: michael.melzer@man.eu

Christoph Speckamp  
Tel.: +49 (0) 208 – 692 95 69  
E-Mail: christoph.speckamp@man.eu  
Internet: www.mandieselturbo.com

### **MTU Aero Engines GmbH**

Dachauer Straße 665  
80995 München, Germany

### **Corporate Communications and Public Affairs**

For further information,  
please contact:

Odilo Mühling  
Tel +49 (0) 89 14 89 26 98  
E-Mail: odilo.muehling@mtu.de  
Internet: www.mtu.de

In the Pearl GTL plant in Ras Laffan the compressors will process 130 million m<sup>3</sup> of air per day after commissioning in order to ensure the daily oxygen requirement of 28 000 tonnes for the GTL process. The necessary power input of 640 MW roughly corresponds to the average electricity requirements of a city of 700 000 inhabitants, including industrial, commercial and retail consumption.

New plants that are currently in the planning stage envisage an oxygen requirement that exceeds more than twice that for present-day plants.

"As the world market leader in axial compressors, we have closely followed the trend towards ever bigger plant complexes and have therefore constantly developed our relevant products to ensure 'mega capability'. However, to economically meet the performance requirements of future plant sizes, we needed a technological quantum leap. We have now managed this – after three years of development work – with the engine compressor technology know-how of MTU", states Dr. Hans-O. Jeske, Chief Technology Officer and Head of the Turbomachinery Strategic Business Unit at MAN Diesel & Turbo.

Egon Behle, CEO of MTU Aero Engines, adds: "MTU unequivocally supports a diversification of our core competences in similarly positioned products such as industrial compressors and industrial gas turbines."

With the development of this hybrid compressor MAN Diesel & Turbo strikes a completely new path. It is the first compressor blading, which combines the benefits of current industrial compressors, such as high efficiency, broad operating range and robust design, with the high power density of gas turbine compressors.

"In this compressor development project, which is the largest in the history of the company, we have investigated in great detail all variables to ensure optimal compressor design in the realisation of the hybrid concept. Comprehensive matrix studies have been carried out in all areas of the design, taking into account all aspects, e.g. aerodynamics, mechanics, rotor dynamics, production, costs etc., in order to ascertain and implement the optimal solution for the new generation", comments Dr. Kai Ziegler, Head of Compressor Development at the Business Unit Process Industry at MAN Diesel & Turbo.



**MAN Diesel & Turbo**



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Following the conclusion of the first test programmes at the MTU test stands towards the end of this year the new hybrid compressor will be released for sale.

**About MAN Diesel & Turbo**

MAN Diesel & Turbo SE, based in Augsburg, Germany, is the world's leading provider of large-bore diesel engines and turbomachinery for marine and stationary applications. It designs two-stroke and four-stroke engines that are manufactured both by the company and by its licensees. The engines have power outputs ranging from 450 kW to 87 MW. MAN Diesel & Turbo also designs and manufactures gas turbines of up to 50 MW, steam turbines of up to 150 MW and compressors with volume flows of up to 1.5 million m<sup>3</sup>/h and pressures of up to 1,000 bar. The product range is rounded off by turbochargers, CP propellers, gas engines and chemical reactors. MAN Diesel & Turbo's range of goods includes complete marine propulsion systems, turbomachinery units for the oil & gas as well as the process industries and turnkey power plants. Customers receive worldwide after-sales services marketed under the MAN PrimeServ brand. The company employs around 12,700 staff at more than 100 international sites, primarily in Germany, Denmark, France, Switzerland, the Czech Republic, Italy, India and China. MAN Diesel & Turbo is a company of the Power Engineering business area of MAN SE, which is listed on the DAX share index of the 30 leading companies in Germany.

**About MTU Aero Engines**

With a workforce of some 7,600 people, MTU Aero Engines is Germany's leading engine manufacturer and one of the major players in the engine business. In fiscal 2009 the company posted around 2.6 billion euros in sales. In the commercial area, MTU is the world's largest independent provider of engine maintenance services. In the military arena, it is Germany's industrial lead company for practically all engines flown by the country's armed forces. Having carved out leading positions in engine technologies, the company excels in low-pressure turbines, high-pressure compressors, manufacturing and repair techniques.