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Commissioned MAN 12V48/60 Engine Features SCR System in Endesa Diesel Power Plant in Ceuta

Endesa, the Spanish energy supplier, has completed the extension to its power plant in Ceuta with the installation and commissioning of an MAN 12V48/60B engine. MAN Diesel & Turbo, Spain negotiated the contract for the new engine that includes the supply of an SCR (Selective Catalytic Reduction) system.

The 12V18/60 engine is the fourth such engine installed at Ceuta and has been Endesa's engine of choice for many of its other power plants. The integrated SCR system significantly reduces NO_x emissions at the plant and hence Endesa's environmental impact locally.

With the installation of the engine, termed "Group 13" under its project classification, four MAN 12V48/60 models are now in operation at the power plant in Ceuta. The Ceuta engine, "Group 9", has an "A" turbocharger configuration while the rest, "Groups 10 and 13, have "B" turbocharger configurations.

The MAN 12V48/60B engine is a four-stroke, medium-speed diesel engine with turbocharger and cooling charge air that is specially designed to run on heavy fuel oil (HFO) and diesel oil for start-up/shut-down. In comparison with other similar engines, the 12V48/60 model features a high power supply and a compact and efficient design.

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Principal Engine Data	
Bore (mm)	480
Stroke (mm)	600
Engine speed (min⁻¹)	500
Piston speed (m/s)	10.00
Effective pressure (bar)	23.21
Power per cylinder (kW/cyl)	1,050
Engine power - crankshaft (kWm)	12,600



The auxiliary systems that complete the scope of supply are standard for this kind of engine, with the exception of the SCR system.

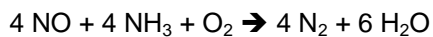
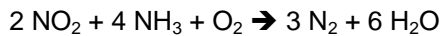
SCR system description

The SCR system removes NO_x from the engine's exhaust gases. This process takes place within the catalytic converter and employs a urea solution as a reactive agent. The urea is injected into the flow of the exhaust gases by injectors with atomised air before the exhaust gases reach the catalytic converter.

When injected into the exhaust-gas flow, urea releases ammonia (NH₃) according to the following equation:



Subsequently, NH₃ reacts with NO_x on the surface of the catalyst which speeds up the following reactions:



Besides the catalytic converter, the SCR system is made up of the following components:

- A urea supply and storage system (40% urea solution) including urea storage tanks and unloading and circulation pumps
- NO_x control system to control urea injection
- Urea dosification unit
- Soot blowers
- Monitoring system for released NH₃ ("ammonia slip")

Avoiding the converter is possible thanks to by-pass valves. Due to these, the temperature remains constant in the catalyst converter and always above 320°C. If the temperature of the exhaust gases is lower, then the control system automatically keeps the system disconnected.



MAN Diesel & Turbo's Power business unit in Augsburg offers a broad range of SCR systems as well as other emission-reduction systems for its entire portfolio of engines.

Endesa and Ceuta

Endesa S.A. is the largest electric utility company in Spain and a subsidiary of Enel, the Italian utility company. It has 10 million customers in Spain, with domestic annual generation of over 97,600 GW_h from nuclear, fossil-fuelled, hydroelectric, and renewable resource power plants.

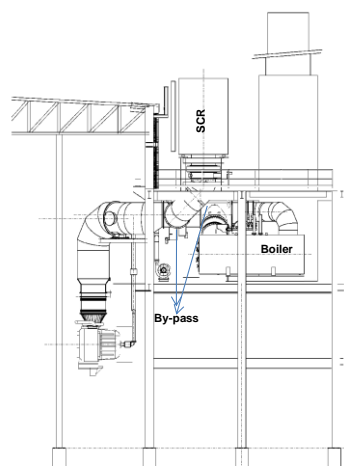
Ceuta is an autonomous Spanish city, located on the North African side of the Strait of Gibraltar, and separated from the Spanish mainland by the Mediterranean.



Aerial view of the SCR system's urea tanks in Ceuta



External view of the SCR system in Ceuta



Technical drawing of the Ceuta SCR system

Press Release

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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 47 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 m³/h and pressure levels 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 also 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 12,500 staff at over 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.

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