



## Further Milestone for New Dual-fuel Engine

# First Stationary Successes for MAN Diesel's 51/60DF

**11 November 2008.** The new 51/60DF dual-fuel gas engine from MAN Diesel has now passed its second major milestone in electrical power generation applications.

Following closely on the handover of a heavy fuel engine retrofitted to full 51/60DF specification at an existing cogeneration installation in Portugal, MAN Diesel Australia has booked the first order for new 51/60DF engines in a power plant application.

The turnkey contract has a value of 60 million Australian dollars and covers the design and construction of a new 22 MW power station at Owen Springs, 25km south of Alice Springs, for Power and Water Corporation (PWC), a major Australian public utility. The Territory's PWC is a Northern Territory Government owned corporation and services more than 80,000 customers and has 360 MW of existing power generation capacity.

The new Owen Springs Power Station will be based on two 10.9 MWe generator sets, each powered by a twelve cylinder, vee configuration 12V51/60DF engine. The generator sets will supply baseload power to the local grid in their gaseous fuel mode, i.e. burning natural gas ignited by a distillate fuel "micropilot".

As well as the supply, installation and commissioning of the generator sets, the scope-of-supply comprises all engineering work including civil and structural works; supply and installation of all electrical equipment and the plant control and monitoring system; all auxiliary systems

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including cooling radiators and supplementary cooling towers to cope with the design ambient temperature of 40°C; project management; and the necessary logistical arrangements. Construction is due to start in the near future and completion of the first stage of the project is scheduled for April 2009, with final completion in 2010.

“MAN Diesel Australia is an experienced company in power station construction and its parent company in Germany specialises in dual-fuel engines in the size range required for this project,” notes John Linton, PWC’s General Manager Generation. “The contract specifications were technically complex as Power and Water was seeking world’s best practice in fuel efficiency and the lowest emissions of carbon dioxide per unit of electricity generated.”

## **MAN Diesel 51/60DF Engines**

For power generation applications the 51/60DF is available in a nine cylinder inline version and in vee configuration versions with 12, 14, and 18 cylinders. The engines have mechanical ratings of 1000 kW per cylinder for 60 Hz power generation (514 rpm) and 975 kW for 50Hz applications (500 rpm). These give an overall generator-set rating range of 8560 to 17550 kWe.

With its fuel flexibility and low emissions, the 51/60DF targets applications where operation on a back-up fuel is either essential or desirable. The engine’s fuel flexibility centres on the capability to operate on either gaseous or liquid fuel, and to switch between them seamlessly at full rated output. In the gaseous fuel mode an air-gas mixture is ignited by injection of distillate diesel fuel. On the 51/60DF, the liquid fuel micropilot amounts to 1% of the quantity of liquid fuel needed to achieve full rated output.

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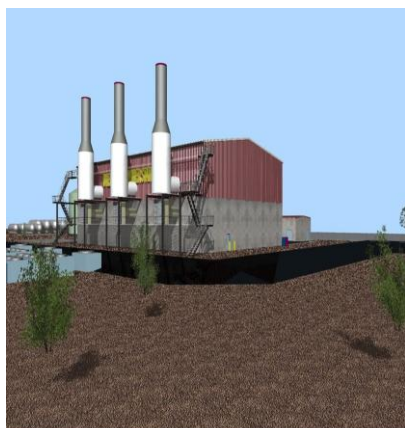
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It is injected via a common rail system which allows flexible setting of injection timing, duration and pressure for each cylinder. This flexibility allows the engine to achieve low emissions and to respond rapidly to combustion knock signals on a cylinder-by-cylinder basis.

In the back-up liquid fuel mode, the 51/60DF engine operates as a normal diesel engine injecting distillate or heavy fuel oil (HFO) through a separate, normally dimensioned injector in a camshaft actuated, pump-line-nozzle system.

At 500 mg /m<sup>3</sup> at 5% O<sub>2</sub> on gaseous fuel, the 51/60DF readily achieves emissions of oxides of nitrogen (NO<sub>x</sub>) in compliance with both Germany's TA Luft clean air regulations and the World Bank Pollution Prevention and Abatement Handbook.



*Computer rendering of the Owen Springs Power Station turnkey project recently awarded to MAN Diesel Australia by Darwin based Power & Water Corporation. The power station will be based on two 10.9 MWe generator sets powered by MAN Diesel 12V 51/60DF dual-fuel engines.*

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*The first stationary commercial application of MAN Diesel's new dual-fuel technology is on a converted 48/60A heavy fuel engine at a Portuguese cogeneration plant which was recently retrofitted to full 51/60DF specification.*

#### Four-stroke dual-fuel engines V51/60DF and L51/60DF

Engine cycle	Four-stroke
Turbocharging system	Constant pressure
Number of cylinders, V-engines	18, 14, 12
Number of cylinder, L-engines	9
Bore	510 mm
Stroke	600 mm
Swept volume per cylinder	122.6 dm <sup>3</sup>
Cylinder output (MCR)	
at 514 r/min, 60 Hz	1,000 kW <sub>m</sub>
at 500 r/min, 50 Hz	975 kW <sub>m</sub>
Cooling	
Cylinder cooling (single stage)	Fresh water
Charge air cooler (two-stage)	Fresh water
Fuel injector cooling	Fresh water
Starting	Compressed air

*Technical data, MAN Diesel 51/60DF dual-fuel engines.*

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## About MAN Diesel

MAN Diesel is the world's leading provider of large-bore diesel engines for marine and power plant applications. The company designs two-stroke and four-stroke engines, generating sets, turbochargers, CP propellers and complete propulsion packages that are manufactured both by MAN Diesel and its licensees. The engines have power outputs ranging from 450 to 97,300 kW. MAN Diesel employs over 7,700 staff, primarily in Germany, Denmark, France, the Czech Republic, India and China. The global after-sales organisation, MAN Diesel PrimeServ, comprises a network of the company's own service centres, supported by authorised partners. MAN Diesel is a company of MAN AG, which is listed on the DAX share index of the 30 leading companies in Germany.

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