



Four-stroke power

01/03/2010

MAN 18V32/40 Engines Provide Foundation for African Venture

MAN Diesel Spain plays central role in establishing 35-MW cogeneration plant for Senegalese cement production

With MAN Diesel as main supplier, Ingemas, the Spanish engineering company and a member of the TSK Group, has developed a turnkey power-plant project for the “Les Ciments du Sahel S.A.” (CDS) cement plant, an investment of €29,500,000.

CDS is located in the Kiréne region of Senegal, Western Africa, some 70 km to the south of Dakar, and has an output of 35 MW from four MAN Diesel 18V32/40 engines (each 9 MW_m or 8.75 MW_e) at 750 rpm. The heavy fuel oil (HFO) -burning engines will cover the current and future power demands of the cement plant while the installation of four boilers for exhaust-gas heat recovery will cover the steam requirements for both the power plant and the cement-production process.

The cement plant originally began production in 2002 and the introduction of the MAN four-stroke engines ties in with the introduction of a second production line, due to start up this year, facilitating an increase in cement production from 600,000 to 3,000,000 tonnes per year. The four MAN engines replace 16 non-MAN gensets and will cut 55% off existing electricity tariffs. The fourth engine will be delivered for preliminary taking over during the second quarter of 2010.

The power plant

The power plant is designed to work on a 24/7 basis without interruption. It is the cement plant's sole power source and continuous power and availability are accordingly paramount. The power plant works in island mode, both in isochronous and drop modes as well as through power control.

All civil engineering, structures, systems and equipment have been designed so as to accommodate a potential, fifth MAN engine in the future, depending on production

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demand. The four new engines run on HFO in normal mode but, for flexibility and to ensure a reliable power supply, are also designed to operate on LFO.

The 18V32/40 units are each integrated with MAN NR34/S turbochargers. As the engines work in island mode and load variations can be high and sharp in the cement plant, so-called "jet assist" devices are fitted externally to the turbochargers. These enable a quick response to such variations by injecting compressed air directly into the compressor wheels of the turbochargers.

Control System

MAN Diesel has developed the control and monitoring system for the new power plant in collaboration with Kuhse, the leading, German manufacturer of process controls for combined heat and power plants and emergency gensets.

The system works by means of network peripherals placed about the plant that collect field information. This is passed on to five PLCs connected by an ethernet network to servers from which optimum operation can be controlled via GUIs. In due course, MAN Diesel will be able to provide supervision and maintenance assistance directly from its headquarters in Augsburg by means of a remote access application.



Les Ciments du Sahel S.A. cement plant pictured during the advanced construction phase of its MAN-fitted power plant. (source: Ingemas/TSK)

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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 47 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 SE, which is listed on the DAX share index of the 30 leading companies in Germany.

Ref no 6510-0168