

Chambersburg dual-fuel plant generates power, revenue and reliability

Energy consumers in the Borough of Chambersburg in Pennsylvania, USA, now enjoy a 13–15% reduction in their annual energy bills. Neighbouring communities, meanwhile, are seeing their rates increase by the same amount. The reason is Dispersed Power Generation based on a Wärtsilä 32DF dual-fuel power plant.



A Wärtsilä 32DF dual-fuel 23 MW power plant was handed over to the Borough of Chambersburg in Pennsylvania, USA, in November 2003. Its four generating sets have logged over 2000 hours since entering commercial operation on 8 November 2003.

This dual-fuel power plant, the first Wärtsilä installation of its type in the USA, provides the client with reliable and economic power. The Borough is able to pick and choose the most economical operating profile between the 'grid' and its own power generation, including operation on different types of fuels. The new plant has an expected 2500–3000 hour operating profile per year. It is capable of providing power to the 69kV grid through two set-up transformers or to feed power to the Borough through four local 15.2kV circuits.

Commissioning successful

The Notice to Proceed for the project was signed on 30 September 2002, and the civil works on the 5-acre site started around 1 March 2003. Seven aggressive months of construction followed, enabling the first-start to take place in September and commissioning in October 2003; this despite the challenge of a major snow storm and one of the wettest springs on record in the region.

Plant commissioning verified the functionality of all the equipment and systems, and the performance guarantees such as heat rates below 8100 BTU/kWh_e, low NO_x and noise levels of 65 dBA (70ft from the building) were achieved. The switchover to the alternative fuel while at full power was also demonstrated as was the 10-minute ramp-up to full load while



operating on gas and even much quicker on diesel fuel.

High degree of automation

Each of the four Wärtsilä 18V32DF, 5.8 MW_e generating set weighs about 105 tons, operates at 720 rpm and has minimal vibration at all power levels. The engines are cooled by HT and LT heat exchangers, supported by cooling towers.

The four separate exhaust ducting systems each contain an SCR/Oxycat and silencer. A tank farm contains three 29,000 gallon diesel oil tanks, lube oil and urea tanks. Two air

compressor systems support the work air and control air demands of the plant.

The power house is a 75ft x 125ft x 30ft (23m x 38m x 9m) pre-engineered steel building. The interior personnel space has two levels: the lower is built of Concrete Masonry Unit (CMU) and the upper is light-gauge steel construction. The control and breaker rooms are also constructed for noise abatement and are fire rated.

The highly automated plant is managed and monitored with Wärtsilä's state-of-the-art control system, comprising the Wärtsilä Operator's Interface System

Baseload power for the Dominican Republic

Domicem, a large cement factory located near the village of Sabana Grande de Palenque in the Dominican Republic, has selected Wärtsilä for a baseload power plant to supply electricity for its quarry and process operations.

Wärtsilä will supply four Wärtsilä 18V32LN generating sets for the project, producing a total of more than 25 MW. In addition to the Engineering, Procurement and Construction (EPC) contract, Domicem has also signed a contract with Wärtsilä to provide all necessary services for operating and maintaining the power plant during the first five years of operation.

“We are very pleased to provide Domicem with a power plant that meets their requirements for reliability and low fuel consumption,” said Mr. Frank Donnelly, vice president of Wärtsilä North America Inc., Power Plants. “This contract also highlights the integration of Wärtsilä’s power plant and after-sales service businesses to provide the customer with a lifecycle project that fulfills their need for a reliable source of power.”

Wärtsilä’s power plant delivery will be part of a project which calls for the design, construction and operation of a new dry process cement plant of 800,000 tons per year (tpy) clinker capacity and 900,000 tpy cement capacity in the Dominican Republic. The Domicem plant is expected to be commissioned by May 2005. The plant’s limestone quarries are located in Sabana Grande de Palenque, a rural farming village with a population of less than 3,500. This plant will be the most modern of its kind in the Caribbean, supplying one third of the island’s cement consumption.

“Wärtsilä had the most extensive experience and the best references in the cement industry and in the Dominican Republic because they have shown that they are dedicated to serving customers in this region,” said Mr. Pasquale Colaiaicovo, Chairman of Domicem. “We were impressed with the fact that they have a local service office and their willingness to stand behind their products with their service business.”

After commissioning of this project, Wärtsilä’s baseload power plants in the Dominican Republic will total 638 MW, with the cement industry accounting for 63.8 MW of this figure. Wärtsilä has delivered 126 MW of power for various self-generating industries in the country. Wärtsilä is the market leader in power generation for the cement industry with worldwide references totalling more than 1200 MW. ■



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(WOIS) for instantaneous control, and the Wärtsilä Information System Environment (WISE) for storing, retrieving and reporting information, which enables reliable and flexible operation with a minimum of personnel. Remote operation and monitoring by broadband networks are also installed and supported.

Power shortage risk minimized

The Borough has successfully applied this Dispersed Power Generation model in the Pennsylvania power auction environment, providing residential customers with a 13% reduction in their annual utility bills and commercial clients with a 15% reduction.

This is big news because other nearby municipalities and cities are seeing their rates increase by at least the same amount. The Borough is able to sell power generation at rates up to \$500/MWh during times of high wholesale prices, high power demand and power congestion. The larger local utility (The Allegheny/Potomac Electric Company) offers a buyback plan, which pays customers to voluntarily run onsite generation (3 MW minimum) during these periods.

The overall management of the grid and power distribution in this region, however, is in the hands of PJM. PJM Interconnection is an Independent System Operator (ISO) and a regional transmission organization (RTO) that manages the movement of wholesale electricity in eight states and throughout Washington DC. They operate and manage the world’s largest competitive wholesale electricity market and centrally dispatched control area.

The dual-fuel feature of the Wärtsilä 32DF provides the flexibility to operate on either diesel fuel oil or natural gas and therefore the ability to choose the more cost-effective alternative as conditions dictate. The dual-fuel capability also increases the power plant’s power generation reliability.

With its Wärtsilä Dispersed Generation and peaking plant, the Borough of Chambersburg enjoys a high level of service and low electrical service rates. At the same time the multi-unit design of the power plant reduces the Borough’s risk of power shortages. ■