



Alternative fuels

> Case History

Jaguar Mine, Australia



Our energy working for you.™

Where:

Kalgoorlie, Australia

What:

Four Cummins QSV91 gas generator sets installed in a remote metal producing mine

Purpose:

Provide cost-efficient, gas-fired power solutions to low-cost producer of zinc and copper concentrates for world markets

Primary choice factors:

Cummins Power Generation was chosen due to reputation in gas generator sets and to assure reliability based on mine's remote location and aggressive production targets

Cummins Power Generation enables Australian metal producer to save money with natural gas prime power

KALGOORLIE, AUSTRALIA — Reliable power from a Cummins Power Generation Inc. natural gas-fired power station has been a key element for Jabiru Metals Ltd. in becoming a low-cost producer of zinc and copper concentrates for world markets.

With diesel fuel costs soaring, Jabiru Metals — an emerging Australian base metals company — knew it had to take advantage of the relatively low cost of natural gas and use gas-powered generator sets for its prime power requirements.

The best technical and commercial solution came from Cummins Power Generation's Energy Solutions Business. "Our research showed that Cummins had a very good reputation in terms of gas generator sets," said Victoria Twiss, a key member of Jabiru Metals' project management team on the Jaguar project. "We needed to be assured of generator reliability because of the mine's remote location and the production targets that have to be met."



A Cummins Power Generation DMC300 Digital Master Control system is used for load demand management of the complete power station.



The QSV911 gas gensets are powered by lean-burn, spark ignited Cummins gas engines — 91-liter, v18 units with turbo-charging and after-cooling.

The power station comprises four Cummins Power Generation QSV91 natural gas generator sets, each capable of producing 1,750 kW. They were installed at Jabiru's remote Jaguar Mine, which is located 300 kilometers north of Kalgoorlie in Western Australia.

"The QSV91 generators have excellent load acceptance capabilities," according to Anthony Mitchell, project and technical manager for Cummins Energy Solutions Business. "The mine loads and mill motors can be rapidly reinstated with minimal generators running. This also provides higher efficiencies as the generator spinning reserve levels are significantly reduced."

The QSV91 gas generator sets are powered by lean-burn, spark-ignited Cummins gas engines — 91-liter, V18 units with turbo-charging and after-cooling, according to Mitchell. "The generator sets are very effective in dealing with high impact loads. At the Jaguar Mine, the generators are capable of load acceptance steps of 50 percent — a key feature of the Cummins gas generator design," Mitchell added.

The Cummins Power Generation generator sets are tapped into the 1,380-kilometer Goldfields Gas Pipeline (via a 30-kilometer lateral) which carries offshore natural gas from Western Australia's North West Shelf to the Pilbara and Goldfields regions, and also Esperance.

The Jaguar deposit — a virgin discovery in 2002 — is a couple of kilometers from the historic Teutonic Bore Mine that was a joint venture between Mount Isa Mines and BP Mining Australia before being closed in 1985 due to declining metal prices and a depleted reserve position.

The delivery of the first Jaguar concentrate to Geraldton port was in July 2007. The underground mine, which has

a reserve of 1.7 million tons, is feeding a concentrator that is averaging 700 tons a day throughput. Revenue from the Jaguar project is mainly from zinc (55 percent), followed by copper (35 percent) and silver (10 percent).

Cummins Power Generation's Energy Solutions Business provided total project management of the power station design, installation and commissioning. "We provided a fully integrated, turnkey installation," said Tony Blaubaum, general manager of the Energy Solutions Business for Asia Pacific. "We designed and built the total power station, which includes the gas generator sets, 11 kV generator set switchboard, acoustic enclosures, cooling and control systems, as well as the remote monitoring system."

A Cummins Power Generation DMC300 Digital Master Control system is used for load demand management of the complete power station, which includes a black-start QSK60 diesel generator set rated at 1,600 kW.

The generator sets are maintained under a contract which is managed by Cummins Kalgoorlie and Cummins Perth.

Cummins Power Generation offers complete Energy Solutions that include system design, project management, turnkey power plant development, financing, maintenance contracts and operations management. Power plants have been designed and installed throughout the world, including: energy-saving cogeneration systems; gas or diesel-fueled prime power systems; on-site peaking plants; and waste-to-energy applications that efficiently use gas from landfills, digesters or coal mines.

For more information about alternative fuel power systems or other energy solutions, contact your local Cummins Power Generation distributor or visit www.cumminspower.com/energysolutions.

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