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POWER GENERATION

Shown are the seven rental power units supplied by Cummins Power Generation, which supply 7 MW of electric power to the gold mine's operations. Each gen-set includes a 50 L, Cummins KTA50-G3 diesel engine with a 60 Hz rating of 1000 kW at 1800 r/min.



Cummins Rental Power for Remote Saudi Gold Mine

With the largest mineral resources of any country in the Gulf region, Saudi Arabia is a land rich not just in petroleum, but also in gold and other precious metals. However, most of these gold deposits are located in remote areas far from the electric grid, which makes the mining and processing activities dependent on on-site power generation.

One such example is the Bulghah gold mine, which began production in late 2002 as one of the resources surrounding the existing Al-Sukhaybarat gold mine — thought to be part of the fabled King Solomon's Mines. The facility is located some 550 km northwest of Riyadh and generates all of its electric power using rental power units from Cummins Power Generation, a subsidiary of Cummins Inc.

Operating 24 hours a day, 365 days a year, the Bulghah gold mine relies on this self-generated electricity to power the vast array of pumps, conveyor systems and crushers, as well as lighting and all miscellaneous electric equipment at the site. This is an open-pit mine that uses the "heap leach" method of gold extraction. An elaborate electric-powered conveyor system transports the crushed gold ore to a plastic-lined pit to create a large pile of crushed ore. A solution of chemicals that dissolves the gold in the ore is pumped over the heap and allowed to filter down through the pile where the solution is collected and further refined to produce pure gold. Using this method, the mine produces approximately 2325 kg of gold annually.

Supplying electricity for this operation are seven CP1250-D6 containerized PowerCommand generator sets from Cummins Power Generation. Each gen-set is prime-rated at 1000 kW for a total system capacity of 7 MW.

The seven generator sets are each powered by the Cummins KTA50-G3. The 50 L diesel engine is already operating in



Electricity from the gen-sets supplies power to operate the massive conveyor system and all the other electrical equipment used at the mine.

many power generation installations worldwide ranging from on-site prime power to emergency standby power for critical applications, according to Cummins. Operating at 1800 r/min and producing electricity at 60 Hz, the generator sets are designed to be easy to start, synchronize and run due to the digital PowerCommand control systems on each generator set. All-digital control is said to improve reliability under extreme operating conditions by significantly reducing analog components and single points of failure.

Depending on the electrical load, only five or six of the generator sets operate at any given time, allowing at least one generator to be offline for maintenance, or in a standby mode, in an effort to guarantee a higher level of reliability for a power system that must run continuously.

"The owner of the mine did not want to undertake the day-to-day operation of the power system, so they contracted with our distributor in Saudi Arabia to install, commission and operate the system," said Don Watson, rental director for Cummins Power Generation in Europe, the Middle East and Africa. "The station has been operating for over three years already without a single loss of power or interruption of the mining or processing."

Under the operating agreement, General Contracting Co., the Cummins Power Generation distributor in Saudi Arabia, operates the system and performs all the necessary maintenance. Local environmental conditions can be harsh. Blowing dust can clog air filters, and high summertime temperatures reaching 55°C require careful attention to generator maintenance. Oil and filter changes are made after every 250 hours of operation.

The power system is installed as a long-term equipment rental for a period of 10 years that includes an operating and maintenance agreement with the Cummins Power Generation distributor in Saudi Arabia.

Saudi Arabia has spearheaded development of the mining sector as part of a program of diversification away from petroleum. The government's objectives for the mining sector include establishing industries for extracting and processing the minerals, and developing the transportation infrastructure. It is estimated that Saudi Arabia has close to 20 million tons of recoverable gold ore, and according to a government website, non-oil mineral activity is expected to grow at a rate of 9.1% annually.

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