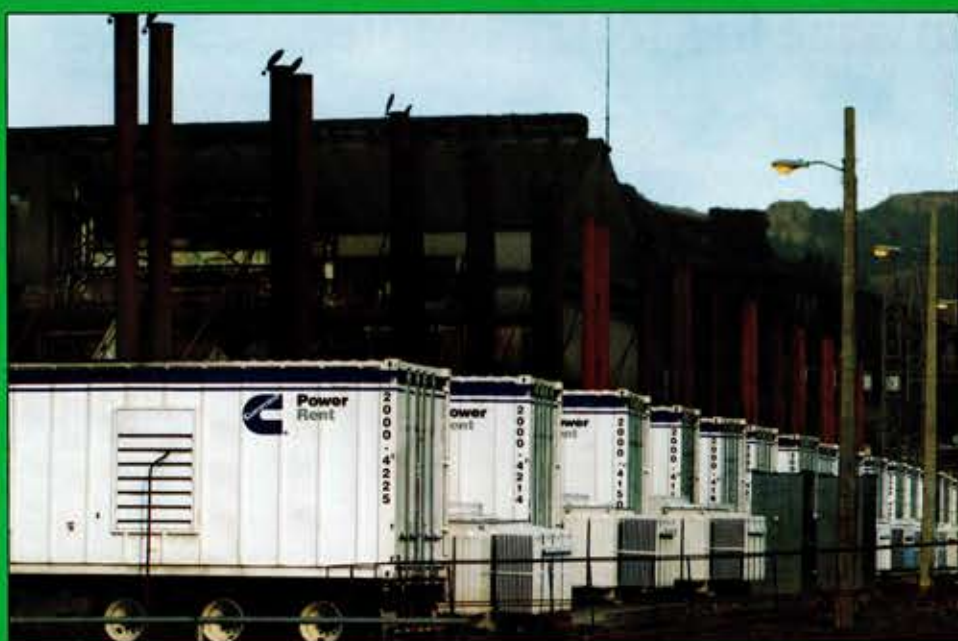


Dominican Mine At Full Production During Boiler Maintenance



For the past 34 years, the Falcondo nickel mine in the Dominican Republic produced upwards of 28,000 tons per year of nickel and ferronickel. Located about 50 miles north of Santo Domingo, the Dominican capital, the mine site includes a metallurgical treatment plant, a crude oil processor and a 198 MW thermal power plant that supplies the mine's electrical needs.

The mine's thermal power plant consists of three oil-fired steam generators and three 66 MW steam turbines that generate power for the plant and provide excess power to the Dominican power grid. Each year, all three turbines have to be shut down in turn from 14 to 21 days while they are inspected and maintained. In the past, one boiler and one turbine were taken offline one at a time, while the remaining boilers and turbines supplied the mine at reduced capacity.

Ferronickel Demand Prompts a Change

"Historically, we simply reduced ferronickel production during the thermal plant maintenance," says Wanda Rosario, Falcondo's senior buyer in charge of special projects. "But, the worldwide demand for ferronickel - which is a combination of iron and nickel used almost exclusively by the worldwide stainless steel industry - has become very strong. We decided it would be better to keep the mine working at full capacity by bringing in temporary rental power during the maintenance period."

Working with Argico, the distributor for Cummins Power Generation and Cummins Power Rent in the Dominican Republic, the mine rented 32-2 MW trailerized diesel generators for a period of three months during the thermal plant maintenance. According to Luis Gigante, president of Argico, 27 of the generators operated online continuously at their 1.6 MW continuous rating, while five of the generators were used for peaking power and maintenance backups. Each trailerized rental

generator is composed of a Cummins Power Generation PowerCommand DQKC diesel generator set and its own control system and fuel supply. Each generating unit is standby-rated at 2 MW and continuous-rated at 1.6 MW. Their individual digital master control systems assure high reliability, precise synchronization with the power grid and the other generators and maximum fuel economy.

Cummins Provides Turnkey Replacement Power

"We provided this the 64 MW temporary power plant to the mine as a turnkey project," says Gigante. "We handled delivery of all the generating units, provided installation, commissioning, maintenance, repair and complete system operation. We even devised a system to reduce the time spent on oil changes from three hours to just 45 minutes - not unlike a formula Formula One pit crew."

Rosario says the selection of Cummins was selected to supply the project was based on product reputation, and as well as the service and support capabilities from of the local distributor. Not only did the 1,632-2 MW MW generators from Cummins provide the most efficient layout on the site, but In addition, Cummins was able to complete the project - from signing the contract to system start-up - in only 45 days., says Gigante.

Twenty-seven of the 32 rental generators operated continuously over the three-month maintenance period that included turbine inspections and replacement of some tube-wall panels in the boilers. Rosario says that each steam turbine needs to go through a major overhaul once every six years. Because such an overhaul can take upwards of 80 days to complete, one turbine undergoes a major overhaul every two years to spread out the impact on power production.

Power Reliability Is an Issue

While the mine is connected to the national power grid, Rosario says that the grid has not been stable enough for their mining operation. "In order for us to operate 24/7, we've had to find our own sources of energy," she says.

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"About 70 percent of the electricity generated is used in our electric furnaces. The next largest portion operates machinery such as mills and driers. The rest is service power, for compressors, motors and lighting and such."

Fuel for the thermal power plant boilers, the ore reduction process, mining equipment and the rental diesel generators is all refined onsite. Crude oil is piped from Santo Domingo to the mine's "topping plant" which converts the oil into naphtha, diesel and fuel oil. The electrical power for the crude oil pumping station is provided by two permanently installed diesel generating units from Cummins Power Generation that together produce 3.75 MW. About 35 percent of the refined petroleum product is naphtha and that is used in the mine's reduction furnaces that process the ore. Under ordinary circumstances, the amount of diesel fuel produced by this plant is rather small, only 10 percent.

"During the time we rented the diesel generators, we purchased a different kind of crude oil mix that allowed us to produce more diesel fuel for the generators," says Rosario.

Power for a Multi-step Process

Falcondo is only one of seven mines in the area that supply refined ore to mills and smelting facilities. At Falcondo's open-pit operation, overburden is carefully removed to expose the ore. Hydraulic backhoes remove the ore from a seam that averages over 20 feet thick, and then the mined-out areas are contoured and reforested with fast-growing tree species.

The first stage of metallurgical processing involves the high-temperature conversion of nickel and iron oxides to a metallic state in what are known as "shaft

furnaces." The ore is then compressed into briquettes and smelted in the electric furnaces that get their power from the thermal power plant. After refining, the metal is cast into ferrocones, which contain about 38 percent nickel and 62 percent iron.

If the worldwide demand for ferronickel remains high, Falcondo will continue to bring in replacement power during its thermal power plant maintenance period. The mine's proven ore reserves should last another 15 years, and with the continuing increases in the popularity of stainless steel products, demand should remain high for the foreseeable future. In the meantime, Falcondo is doing its best to remain energy self-sufficient so it can meet the market demand.

Cummins Power Generation, a subsidiary of Cummins Inc. (NYSE: CMI), is a major leader in increasing the availability and reliability of electric power around the world. With over 80 years' experience, its global distributor network delivers innovative solutions for any power need-commercial, industrial, recreational, emergency and residential. Products include alternators, generator-drive engines and temporary or permanent pre-integrated power systems combining generator sets and power control and transfer technologies. Services range from system design, project management, financing and operation and maintenance contracts to development of turnkey power plants. For more information, contact Debby Wadsworth, Cummins Power Rent, 1400 73rd Ave. NE, Minneapolis, MN, 55432. Phone: 763-574-5395; Fax 763-574-5298. Or visit www.cumminspowerrent.com.

of the Seoul's daily sewage output, the DFC unit will operate on methane gas generated by the facility's anaerobic gas digestion process. One of only four sewage treatment plants in the national capital area, Tancheon is a critical link in efforts to clean the Han River, a major waterway running through the region. The treatment plant has a capacity to treat 1.1 million cubic meters (291 million gallons) per day on a 97-acre site in downtown Seoul.

"These two new sitings support our continued focus on developing repeatable business for firm, 24/7 power generation in two of our ten key vertical market segments - hospitals and wastewater treatment facilities," said Dan Brdar, FuelCell Energy's Chief Operating Officer. "Furthermore, this demonstrates how our ultra-clean DFC power plants are an ideal energy solution for a region with high energy costs and the drive to reduce carbon dioxide emissions, a key contributor to global warming."

This summer, MOCIE established a Renewable Portfolio Agreement (RPA) with Korea's nine largest energy suppliers to support new forms of energy and energy renewal projects in a bid to cope with rising price of crude oil bill. The RPA will lead to the reduction of some 170,000 tons of emissions of carbon dioxide, the main greenhouse gas in global warming, or 0.12 percent of Korea's total emissions in 2004. The ministry plans to support the participating companies financially and administratively to help them carry out projects.

For more information go to www.RemoteMagazine.com/rs.htm

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