

Wastewater treatment plant with Waukesha* gas engine goes off the grid, saves green

VHP* rich-burn engine meets ultra-low emissions standard while providing more than 40 percent cost savings.



Location

Big Bear, California

Engines

VHP* Series F3524GSI

Story

GE's Waukesha rich-burn engine moves wastewater treatment facility to energy independence, providing power during rolling blackouts and saving Southern California customers thousands of dollars.

"We decided the answer to our issues was a complete workhorse of an engine that could serve as our primary source of electricity during the winter months when our usage is highest," says Fred Uhler, the plant's senior operator. "We were also able to take advantage of a rebate being offered by the state energy commission that covered half the cost of acquiring a generator that could do the job."



imagination at work

Situation

At an altitude of 6,700 feet, the engineering staff at Big Bear Area Regional Wastewater Agency (BBARWA) had contended for years with a series of pressures on its electrical power supply. Rolling blackouts are common to the Southern California community during peak demand hours, energy prices are among the highest in the country, and there is a tremendous variation in demand on the system since it's located in a resort area where the population waxes and wanes depending on the season. In addition, the area's emissions regulations currently are among the most stringent in the United States with permit requirements of 11 PPM (about 0.16 g/bhp-hr) NO_x and 72 PPM (about 0.66 g/bhp-hr) CO.

Solutions

Plant superintendent Joe Hanford and his colleagues did their homework and selected a Waukesha F3524GSI-driven generator set paired with a three-way catalyst because it provided the solution for their challenges. GE's Waukesha rich-burn engine offered full-rated power – even at 6,700 ft. – and a low-cost method of meeting ultra-low emissions requirements. The team knew a lean-burn engine was not the best option for their application, due to the significant power derate at high altitude and the selective catalyst reduction (SCR) system required to meet emissions. The SCR uses urea injections, which would have meant an additional cost of operation and environmental concerns. The engine was commissioned into service in May 2004, and ultimately created a paradigm shift for the agency that had once been one of the largest consumers of energy in the community where only 38 percent of the area's 50,000 residents live on a full-time basis.

Fast forward to today: *The agency not only operates within the current emissions requirement, but it's also entirely independent of the local utility, freeing much-needed energy for the rest of the community while realizing additional cost benefits for its ratepayers.*



Results

According to BBARWA staff, at peak usage, the engine provides the electrical power to treat more than 5.4 million gallons of wastewater daily. This has resulted in a cost savings of 40 percent versus buying from the utility. The agency further controls costs by purchasing large quantities of natural gas at negotiated rates.

Additional savings are achieved by avoiding levies of \$6,500 the local utility charges for “on-peak” demand. “We’ve also started using the excess power we generate to supply the agency’s administration building and that saves us more than \$1,200 per month,” Hanford added. “Another way to look at this would be to compare it to diesel fuel. If we were using diesel-powered engines at today’s prices, it would be at six times the cost per kWh, which we’d have to pass on to our ratepayers.”

“There’s not anything about this decision that we would have done differently, except maybe do it sooner. The gen set operates without any trouble and its few minor repairs have not been with the engine itself, but with a simple peripheral part. When you’re using one of these, you get only ‘uptime,’” concluded Hanford.



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