

Building New Generation Is Faster, Easier

Power supply forecasts were worrisome. In late 1999, officials of Jonesboro, Ark., City Water & Light knew demand for electricity in their region would continue to rise, just as the market was anticipating a major shortage by June 2000. Manager Ron Bowen decided the best solution was to build a 45-MW peaking plant using the General Electric LM6000 combustion turbine engine. By owning its own plant, the utility could avoid purchasing high-cost replacement power and could sell surplus energy on the wholesale market. Jonesboro worked with Spectrum Energy, Inc., a firm specializing in turnkey generation development services, and had its new plant running by summer 2000.

The nine members of Delaware Municipal Electric Corp. (DEMEC), a joint action agency headquartered in Dover, faced a similar situation in mid-2001. The growth of beach resorts and commercial development in the state was driving up demand for electricity, but the region is burdened by a transmission bottleneck. DEMEC worked with Spectrum Energy to install a new 45-MW plant, which went on line Jan. 1, 2002.

With offices in Irvine, Calif., and Charlotte, N.C., Spectrum Energy provides complete engineering, procurement, construction and commissioning services for combustion turbine and reciprocating engine power plants. Through Spectrum Energy's alliance with Hometown Connections, a subsidiary of the American Public Power Association, APPA members purchasing generation development services from Spectrum will save 10 percent on the associated engineering costs.

"We had a great experience working with Spectrum on our 45-MW turbine peaking plant," said Jonesboro's Bowen. "They met each of their commitments on a very time-pressured project."

Bowen asked Spectrum Energy to help

Jonesboro find a used GE LM6000. The same engine used in 747 airplanes, the LM6000 offers high efficiency and attractive installation costs. As Bowen came to know the Spectrum team and its expertise with this particular engine, the utility decided to purchase a new dual-fuel (natural gas and diesel) unit through the company.

"Spectrum was a perfect fit for us," said Bowen. "In addition to knowing us and knowing our engine, they were very flexible about our project design. For example, we wanted to use our own local builder and we wanted to take care of the power plant permitting ourselves. And that was fine with Spectrum."

Bowen also believes the management structure of Spectrum Energy was well suited to his project. "At Spectrum, the principals of the firm do the actual engineering work," he said. "The same guys who design the plant are there for the start-up. We experienced none of the confusion that can accompany projects with different teams of professionals taking care of different components. We worked with the same talented Spectrum employees from the very beginning of the project to the very end."

Market conditions led DEMEC to build its 45-MW peaking plant in Smyrna, Del., also using the GE LM6000 combustion turbine dual-fuel engine. Because DEMEC member distribution systems are located throughout the Delaware peninsula, DEMEC members have trouble obtaining a sufficient quantity of low-cost power.

In 2000 and 2001, because of insufficient transmission capacity on the Delaware peninsula, DEMEC paid above-market constraint prices for the delivery of power from PJM Interconnection, the regional Independent Transmission System Operator.

Average delivered energy prices in the PJM region typically hover around \$30 per MWh, said DEMEC President and CEO Patrick E. McCullar. But PJM charged DE-

MEC as much as \$50 per MWh for the same energy delivered to the Delaware peninsula. In addition, the Delaware region was sustaining blackouts and near blackouts.

"It shouldn't be that way, but in reality there are load pockets on the Delaware peninsula that suffer transmission constraints," McCullar said. "In our region, the transmission grid owners are not maintaining the lines to manage the load growth."

When DEMEC projected its requirements for the next 10 years, the agency determined it would be more cost-effective to build its own peaking plant to avoid the high constraint pricing and to obtain more reliable service. DEMEC also hopes to earn revenues by selling surplus capacity and energy at wholesale.

Once it decided to build a new plant, DEMEC issued a request for proposals and received three responses. "Spectrum Energy's proposal stood out as the lowest cost, but it also offered DEMEC the opportunity to customize the plant design," McCullar said. "We wanted a design that would allow us to build one unit now but accommodate a second unit later when the economics for that unit make sense. Spectrum was the only bidder that could give us this design flexibility while keeping the engineering and other costs low."

DEMEC was not looking for a turnkey project in which one firm would handle engineering, procurement and construction. McCullar explained, "We wanted to purchase the plant equipment and participate in all other aspects of the project. And that was fine with Spectrum."

In addition, the DEMEC team was apprehensive about building a new plant because none of the participants had worked on such a project for 30 years.

"Spectrum stayed by our side throughout the project, working with us on all phases," McCullar said. "Their team is very flexible, experienced and always accessible. For exam-

ple, after the plant was built, we discovered a problem with a piece of telemetry equipment. Mark Gilliss of Spectrum called me back from another job site within 10 minutes, ready to track down the solution. It's very comforting that the principals of Spectrum Energy design the plant, are on site during construction and are still on hand to troubleshoot when the project is complete."

As soon as it decided to build a new peaking plant, the DEMEC board of directors set out to build the cleanest fossil-fuel-burning plant possible, exceeding federal and state emissions requirements. The new peaking plant in Smyrna incorporates state-of-the-art selective catalytic reduction technology that converts nitrogen oxide emissions to nitrogen and water. The new plant is the cleanest thermal power plant in Delaware.

"DEMEC members are public utilities that take seriously their commitment to the air quality in their communities," McCullar said. "We added at least \$3 million, or 10 percent, to

the cost of the project in order to incorporate the SCR technology. It was the first time the Spectrum team had installed SCR technology, and we're very pleased with the final result."

Overall, McCullar describes the project as a great success. "Spectrum provided us with a custom engineering design that met our specifications; an aggressive schedule and cost estimate, which they met; and a quality finished project," he said. "In fact, our performance run tests indicate an additional 10 percent capacity over the initial design estimates, greatly improving the economics for this project."

The principals of Spectrum Energy formed the company in 1998, building a team of individuals who each have at least 20 years experience in the power business. Spectrum specializes in providing full engineering, procurement and commissioning services for the installation of General Electric and Pratt & Whitney combustion turbines. Spectrum has installed 225 MW of LM6000s and 300 megawatts of Pratt & Whitney Twin Pacs. Many of Spectrum's employees engineered

and installed some of the first LM6000s since the early 1990s.

In addition to the smaller peaking plants installed for clients like Jonesboro and DEMEC, Spectrum has built larger plants, including a 250-MW frame-based combustion turbine project for Constellation Power and a pair of LM6000 projects totaling 135 MW for Public Service Co. of New Mexico. The firm has handled site selection and project development of 7,500 MW of merchant power plants in 10 states. Spectrum uses several state-of-the-art tools in its design process, including a sophisticated software program to analyze different equipment designs to optimize the heat rate—assuring the lowest fuel consumption for the energy generated. Spectrum Energy's services include:

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- initial project consultation, including scope, goals, economics;
- identification of attainment/non-attainment zones;
- site identification and land acquisition;
- air emission calculations;
- support preparation of permits including: air, water, zoning, construction, etc.;
- interconnection requests, for electric and gas transmission;
- power plant engineering, procurement;
- project management, construction and commissioning.

"We take great pride in putting power in the hands of the utilities," said Spectrum Energy Vice President Mark Gilliss. "At a time of volatile wholesale power markets and transmission constraints, today's power plant technologies make it possible to offer utilities energy self-sufficiency and new sources of revenue."

The decisions by Jonesboro City Water & Light and DEMEC to build new power plants are indicative of a broader trend

in public power. "We have seen a dramatic increase in the number of public power systems both evaluating and installing new generating facilities," said David W. Penn, executive vice president, American Public Power Association. "These include large base-load gas-fired facilities like the recent project completed by City Public Service in San Antonio, to strings of distributed resource units in Ohio and Illinois and small peaking units tailored to an individual community's needs."

Historically, public power utilities have always analyzed the build-or-buy options, understanding the financial risks of high and volatile wholesale prices and the dangers that service interruptions pose to their business and residential customers. "The Enron debacle and the risks it presents on the wholesale market only reinforce public power's determination to pursue options that ensure the economic and reliable delivery of service in its communities," Penn said.

"Hometown Connections is proud to announce this relationship

with Spectrum Energy, a company with a solid record of working successfully with public power," said Tim Blodgett, president & CEO of Hometown Connections. "Public power utilities should look to Spectrum Energy for information and advice as they evaluate the timing and feasibility of a generation project."

"We focused on structuring this relationship to bring maximum value to public power," said Dennis Melton of Hometown Connections. "We followed up with Spectrum's previous public power clients and received encouragement that we were heading in the right direction. This relationship meets the primary goals [that] Hometown Connections values when seeking a partner: solid experience within the public power sector, a company with sincere and straightforward employees and an understanding of how public power utilities think and operate." ●

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