

RENTAL powerprofile

CUSTOMER: Tacoma Power
LOCATION: Washington

Customer Requirement: Temporary power

Scope of Supply: Equipment –
30 Cat® XQ2000 power modules with
Selective Catalytic Reduction

Services –
Site evaluations
Engineering planning
Site permitting and commissioning
Equipment testing
Delivery, setup and installation
On-site operation and maintenance

Cat Rental Power Dealer: NC Power Systems
Tukwila, Washington



Tacoma Power's Cat generator sets were the first to be installed in Washington equipped with Selective Catalytic Reduction (SCR) components. These systems have reduced diesel Nox emissions by 90 percent.

POWER NEED

In Tacoma, the dry Washington climate sometimes leads to record periods of time without rain. The dry weather could be a recipe for an impending electrical shortfall to a city almost entirely dependent on adequate water levels for hydroelectric power generation. Such was the case one winter season a few years back.

Sequestered within the four walls of city-owned Tacoma Power, Superintendent Steven Klein and other top utility officials battled unfavorable data to devise a way to provide water to the parched city.

Meanwhile, several California utilities facing similar energy shortfalls had already been forced into rolling power blackouts. These utilities considered bankruptcy as wholesale energy prices hit the ceiling.

“By the end of November, we were in the middle of the worst drought on record,” recalls Klein. “Based on the market price for power, we were in big trouble. With predictions of a cold front (which threatened to further increase load demand), our power costs on the real-time market jumped to nearly \$3,000 per MW hour by early December.”

Tacoma Power had been paying an average of \$20 per MW. The utility serves a customer base of 155,000 residents in several communities, two area military bases and three major heavy industries. While average loads run about 640 MWs, utility usage can peak as high as 1,200 MW during the heating season, which the city entered last December.

“On December 12, we informed the city’s utility board that the market price for power was ranging from \$125 per MW hour all the way up to \$5,000,” Klein says. “We projected depleting our entire cash reserve in two to three months and facing serious financial consequences,” Klein explains.

By the end of December, the utility’s power shortfall was growing, and it was buying power at unprecedented market rates.

TOTAL SOLUTIONS

With possible financial ruin staring them in the face, it was clearly crunch time for all parties concerned. Tacoma Power’s decision makers imposed severe cost-

cutting measures internally. The city mayor even helped wage a major conservation campaign, raising retail and commercial electric rates and pleading the utility's case in government circles. The energy conservation did help. In fact, through mid-July 2001, utility customers shaved power usage by 12 percent. But it wasn't enough. "We needed to provide our own source of short-term power," explains Klein. "The best way to do that was through a partnership with an electric power generation supplier like Caterpillar." Caterpillar® dealer, NC Power Systems (Tukwila, Wash.), offered a proposal that allowed for enough temporary power to supply much-needed electricity to Tacoma Power's waiting customers.

RESULTS

On January 24, 2001, the first of the 30 Cat XQ2000 diesel power modules were generating 48 MW of continuous power for Tacoma Power's customers. The modules were producing enough energy to supplement the drought-induced shortfall from the company's hydroelectric dam. Tacoma's Cat power modules provided 1.6 MW of continuous power each and incorporated 3516B Cat engines rated at 2,800 hp. Each power module also utilized Selective Catalytic Reduction (SCR) technology to reduce NOx emissions by 90 percent.

Under a lease with purchase option, the total cost to run the power modules was less than \$150 per MW hour

— considerably less than the current market cost.

"During a four-month period, we ran the power modules continuously," remembers Klein. "Market rates were between \$300 and \$500, and we were saving as much as \$500,000 per day over market prices," he added.

"The fact that we obtained approval and had the diesel generators online so quickly is a testament to our staff's capabilities, to our relationship with NC Power Systems and to the way we all did our homework."

Kim Moore, assistant generation manager, says a combined task force of engineers from Tacoma Power and the Cat Dealer worked to facilitate integration, synchronization and linkage between the municipal system and the generators. The initial setup provided for manual start-up as the goal was continuous power.

"The Cat Dealer's engineers worked with our engineers at the site during the first month of operation," Moore says. "A tremendous effort was made by everyone. The Dealer was so efficient with delivery that we hadn't even finished site preparation when the first power modules were delivered," he explains.

Once the modules were online, Cat Dealer technicians trained Tacoma utility mechanics to perform regular 500-hour preventive maintenance on all 30 power modules. The maintenance schedule was sequenced to include two modules per day, each requiring three to four hours of maintenance downtime, so only one module was off-line at a time.