



Encorp Equipment Shaves Fort Bragg's Electric Demand



The Challenge: Control Peak Demand

Fort Bragg, one of the largest army bases in the United States, faced an enormous challenge: the 160,000-acre base was consuming peak electricity at an alarming rate. Since opening its doors in 1918, Fort Bragg has grown ever-more power dependent as staff ranks have swelled to 45,000 personnel and electronic equipment has appeared on the training field.

An aggressive plan of supply- and demand-side measures. Located near Fayetteville, N.C., Fort Bragg receives its electricity from Carolina Power and Light and has contracted for a maximum demand of 78 megawatts that can be imported without penalty. To limit this ever-rising demand and avoid penalty charges from CP&L, Fort Bragg deployed an aggressive plan of both supply- and demand-side measures to ensure its usage remains below the contracted level.

A Timely and Cost-Saving Solution

On the supply side, Fort Bragg is using ENCORP hardware and software under a shared-savings contract with Honeywell Home and Building Control Division and CP&L. With ENCORP, Fort Bragg has converted existing standby engine-driven generators to closed-transition, grid-interconnected operation during peak demand.

Cost effectiveness during peak demand. In June 1999, ENCORP and Fort Bragg retrofitted standby generators at 11 different buildings, which supply up to 3.85 megawatts of power and were operating independently from the grid. Just 12 weeks later, grid-parallel operation was successfully achieved—well in advance of the first real test of ENCORP's peak-shaving solution. A February 2000 peak pushed the real-time price of electricity higher than normal levels. The networked gensets worked as expected, demonstrating their cost effectiveness during peak demand.

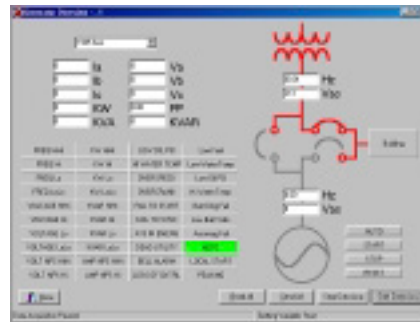
Typically, the 11 Encorp-enhanced gensets will operate only about 200 hours per year, primarily between June and September when electric demand and prices are at their highest.

The Result: Attractive Economics for All Players

Fort Bragg's peak demand already has dropped by 3.85 megawatts due to the peak-shaving conversion, and electricity costs will continue to decrease significantly. In addition, Fort Bragg will recognize improved functionality from its Encorp-enhanced generators. Regularly exercising engines and generators under load improves their reliability and availability

in the event of a grid outage.

Shared Savings. While the peak-shaving project is being executed as a shared-savings contract, Honeywell projects the simple payback on the conversion will be



less than four years. The local utility, Carolina Power and Light, recognizes gains through Fort Bragg's use of the existing standby generators because the utility can reduce its demand.

Finally, under the shared-savings contract, Honeywell assumed all equipment procurement, installation, maintenance and service costs, providing Fort Bragg with an immediate reduction in operating cost with no out-of-pocket expenses.

How It Works: Peak-Shaving at Fort Bragg

The 11 engine-driven generators are located at various facilities at Fort Bragg to limit peak electrical demand. A common electrical distribution system serves the facilities. Encorp equipment installed at each generator allows the generators to run in parallel with each other as well as to be interconnected with the grid.

Encorp entelligent®-VMM (Virtual Maintenance Monitor) software manages the 11 enpower™-GPC (Generator Power Control) units controlling the generators, which in turn are connected through a LONWORKS® communication network.

Fort Bragg Operators select maximum demand. Operators at Fort Bragg use the entelligent®-VMM software to limit overall demand. The VMM provides an interface to the enpower controls, which in turn start and stop generators to maintain demand below the set point. Operators also use the VMM to monitor all engine and generator parameters, in addition to electrical demand at each local substation.

Operators for each generator instantaneously can access generator status, maintenance requirements and alarm information via the single central Dispatch Workstation running ENCORP's VMM software. When routine maintenance is required or an alarm condition is indicated, the appropriate maintenance personnel are dispatched for the specific problem.

Fort Bragg personnel provide all routine maintenance.

Honeywell reimburses Fort Bragg for associated costs under the shared-savings contract. Engine overhauls and other major service requirements are provided by contracts, issued directly by Honeywell, to the local service representatives for the specific equipment.

The Next Step: Successful Follow-Up to Phase One

As a follow-up to the success of the first phase of the peak-shaving project, ENCORP has converted three additional 850 kilowatt generators to grid-parallel operation. The generators

feature paralleling switchgear similar to the previously converted units and are connected to the existing ENCORP workstation for single point system monitoring and control. When converted the units will provide Fort Bragg with an additional 5 megawatts of peak shaving capacity. In addition, two 1,200 kilowatt generators are in the queue for conversion.

Fort Bragg also is considering demand-side measures, including engine drives to replace electric motors and smaller, grid-isolated standby generators to operate water and wastewater pumps.

Peak Shaving Checklist:

If your facility faces several of the following costly energy-related issues, contact Encorp to evaluate opportunities to reduce energy costs and increase standby generator reliability.

- Expensive electric demand charges.
- Ratchet clauses that result in paying a significant demand charge throughout the year as a result of a seasonal peak, typically from summer air conditioning.
- Expensive on-peak electricity prices resulting from real-time pricing or other time-of-use rates.
- A "peaky" demand profile. Operating a generator for only 100-200 hours per year generally can reduce short duration peaks.
- Standby generator assets over about 300 kilowatts are available for peak shaving. The more and larger the units the better. Project costs (on a \$/kW basis) are reduced as total capacity increases.
- An interested electric utility. This partnership can significantly streamline the approval process and may provide additional benefits for both parties.