



COLORADO INDUSTRIAL ENERGY CHALLENGE

Improving Efficiency, Reducing Costs and Emissions

PROFILES IN INDUSTRIAL ENERGY EFFICIENCY

Woodward Shows How Small Changes in Demand Make a Huge Dent in Energy Bills

CUT ENERGY BILLS, KEEP MORE JOBS

“It costs a lot of money just to do business, and we want to be as efficient as possible,” said Jerry Becker, Woodward’s Facility Manager in Fort Collins and Loveland. “I asked myself ‘How can I make an impact for Woodward?’ So, I started looking closely at our energy bills.”

What he found surprised him: at the Fort Collins facility, due to the rate structures during peak times, 45% of the entire year’s energy costs came from just 12 hours per year. The stats from the Loveland facility were even more stark: 45% of energy costs were from just three hours of usage per year. In total, these 15 hours cost the company \$675,000. Finding out when these hours occur, and cutting electric load during those hours, became a priority for the facilities group.

ABOUT WOODWARD

Woodward is an independent designer, manufacturer, and service provider of energy control and optimization solutions used in global infrastructure equipment. It serves the aerospace and defense, power generation and distribution, and transportation markets. Woodward’s systems and components optimize the performance of commercial aircraft; military aircraft, ground vehicles and other equipment; gas and steam turbines; wind turbines; reciprocating engines; and electrical power systems. The company's innovative fluid energy, combustion control, electrical energy, and motion control systems help customers offer cleaner, more reliable, and more efficient equipment. Its customers include leading original equipment manufacturers and end users of its products.

Quick Facts

LOCATION: Fort Collins and Loveland, Colorado
MARKET SECTOR: Engine, turbine, & electrical systems
CIEC ENERGY GOAL: Reduce energy consumption per man-hour by 10% from 2009 levels
PROJECT: Automated load shedding
YEARLY COST SAVINGS: \$310,000
PAYBACK: 9 months
COST SAVINGS EQUIVALENT TO: 5 months of free electricity for the Loveland plant

Fort Collins Facility

FACILITY SIZE: 234,152 sq ft
ENERGY USAGE: \$701,812, 15.9 GWh. \$3,90/sq ft
EQUIPMENT: Receiving unit, programmable logic controller
PEAK DEMAND SAVINGS: 5116 kW, ~\$72,000
YEARLY ENERGY SAVINGS: 1.2 GWh

Loveland Facility

FACILITY SIZE: 187,807 sq ft
ENERGY USAGE: \$754,674, 12.5 mkWh, \$4/sq ft
EQUIPMENT: No extra equipment
PEAK DEMAND SAVINGS: 5120 kW, ~\$46,000
YEARLY ENERGY SAVINGS: 1.4 GWh



An Easy Solution



A receiving unit at the Fort Collins plant gets a signal from the utility about upcoming peak times (above) and the signal is fed to a programmable logic controller (below) to automatically shed non-essential loads.

More Efficiency Successes

In 2008 and 2009, Woodward invested \$250,000 on automated building controls, lighting retrofits, and new compressors, resulting in reducing Woodward's annual electricity consumption at the two facilities by roughly 9% and saving about two million kWh of electricity each year.

LOAD SHEDDING AT THE FORT COLLINS PLANT

Woodward's Fort Collins' plant is charged a much higher rate for all electricity consumed during its utility's system-wide peak, called the coincident peak. In order to know when the coincident peak is about to occur, Woodward installed a receiver unit similar to those used in the residential sector to control air conditioners (see photo at left). "When the grid is fixing to hit the top, we get the signal, and we can automatically start shedding loads," said Becker.

What loads get reduced? The air handling units, the compressor units, the lighting, "and anything else that doesn't affect the manufacturing process," says Becker. "We don't want to touch anything that might mess up our product." All of this load shedding happens automatically by being tied into a Metasys programmable logic controller (PLC), originally installed for the maintenance program but re-programmed to also manage energy.

"For those two hours of coincident peak, that's \$5,000 saved. The concept works perfectly," said Becker.

"The message is that demand charges can be found, can be seen, and can be reduced in buildings," says Becker

LOAD SHEDDING AT THE LOVELAND PLANT

The Loveland plant required a different approach, because it can't get real-time notification from its utility of when a peak is about to occur.

Instead, Woodward decided to carefully monitor its usage and never allow the plant's total energy demand to go above a pre-determined level. It monitors each meter, monitors the total of all meters, and automatically starts a load-shedding routine once the plant's consumption reaches the "trigger point."

All of the energy costs saved from this approach are equivalent to powering the Loveland plant free for 5 months.

More Info

Cutting electricity during peak times not only has a big impact on a plant's energy costs, but makes the whole electric system run more efficiently.

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