CASE STUDY PASCO PROCESSING

Energy Smart Industrial
BPA ENERGY EFFICIENCY

REFRIGERATION ENERGY IMPROVEMENTS

are saving Pasco Processing more than 1.7 million kilowatt-hours and $60,000 annually.

UTILITY
Franklin PUD

PROJECT
Refrigeration Control System

ENERGY SAVINGS
1,702,599 kWh/y

ENERGY COST SAVINGS
$60,613 per year

PROJECT COST
$256, 891

INCENTIVE
$179,824

PAYBACK
1.27 years

Ammonia refrigeration compressors are most efficient when they are running at full capacity or turned off altogether. Anything in between tends to waste energy and money. Unfortunately for Pasco Processing, a Washington-based frozen food manufacturer, multiple compressors had been simultaneously operating at partial capacity for years.

"Our compressors are older and were operating independently," says Ron Knapp, Boiler and Refrigeration Supervisor for Pasco Processing. "They had no way of synchronizing with the other compressors or turning themselves off. In fact, they could only go into an idle state, which consumes almost as much energy as running at full load."

Pasco Processing's 10 compressors are responsible for keeping six freeze tunnels at a desired temperature and pressure. If they falter or stray from desired set-points, the processed corn, potatoes, onions, peppers and zucchini contained within can be placed at risk.

"We had to constantly monitor the compressors, manually adjust the pressure settings and turn them off when they weren't needed," explains Knapp. "It was time-consuming for our operators; the wear and tear of overuse was causing maintenance issues; and we were paying for a lot of unnecessary energy."

With the help of local utility Franklin PUD and the Bonneville Power Administration (BPA) Energy Smart Industrial (ESI) program, Pasco Processing was able to significantly upgrade its refrigeration compressors and condensers. BPA's ESI program works with Northwest public utilities and their industrial customers—offering program management, technical assistance and financial incentives—to advance energy efficiency throughout the region.

By installing a computer-controlled system with condenser fan variable frequency drives (VFDs), Pasco Processing has dramatically improved the efficiency of its refrigeration systems and the cost of its operations.

AN AGGRESSIVE SCHEDULE WITH LITTLE MARGIN FOR ERROR

The biggest hurdle in upgrading Pasco Processing's refrigeration systems was neither cost nor effort, but time. Franklin PUD and BPA ESI not only provided project support and technical guidance, but also financial incentives that covered 70 percent of

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the total project cost. However, the project team had only four months to develop a proposal, commission and conduct a large refrigeration study, secure capital funding, order and install the equipment and fine-tune the new refrigeration control system. Delays would have not only jeopardized the project, but also Pasco Processing's annual vegetable crop.

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With the help of the ESI team and Franklin PUD, Pasco Processing was able to install the new computer-controlled system and condenser fan VFDs for its refrigeration compressors on schedule, improving operations and reducing energy costs in time for its annual crop.

The control system automatically synchronizes and adjusts the compressors, and the condenser fan VFDs ramp up or down to maintain desired pressure. Instead of operating independently, with several running at partial capacity, Pasco Processing's compressors now work together for maximum efficiency. Depending on refrigeration loads and predetermined set-points, the control system ensures only one compressor "trims" (operates at partial load) while all others run at full capacity or are turned off.

"The control system is like an invisible operator," explains Knapp. "In addition to synchronizing our compressors and improving the energy efficiency of our refrigeration systems, it exposes problems that we wouldn't have noticed and catalogs a wealth of data for historical tracking and analysis."

The refrigeration upgrades are saving Pasco Processing more than 1.7 million kilowatt-hours (kWh) and $60,000 annually. This savings combined with the financial incentives from Franklin PUD through BPA ESI allowed Pasco Processing to achieve full payback on its investment in less than 1.5 years.

"This was an expensive project, but the incentives and energy cost reductions have been remarkable," says Knapp. "The upfront investment has quickly turned into ongoing savings, which we can use to reinvest in our company and pursue additional equipment upgrades."

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For information about BPA ESI:

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