Monte Villa Farms

In 2005, Monte Villa Farms of Bothel, Wash., asked its electric provider, Snohomish County Public Utility District, for help in reducing its energy costs. Snohomish PUD completed a field survey of the compressed air system at the site and found that the system had excess capacity, was oversized for the actual air demand of tenants, and was operating at poor part-load performance. The company undertook a compressed air system efficiency project that had an estimated energy savings of 492,049 kilowatt-hours per year; and after Snohomish PUD incentives, the project yielded a net simple payback of six months.

case study

Project at a Glance

1) Total project cost was $52,600.
2) Electricity savings of 492,049 kWh per year — an 87 percent reduction.
3) Electricity cost savings is $32,000 per year.
4) Demand reduction of 45 kW — a demand-cost reduction of $1,954 per year.
5) Snohomish PUD's energy efficiency incentive was $33,314.
6) After rebate, the simple payback = 100 percent rate-of-investment (ROI) in six months.

Monte Villa Farms now has a compressed air system that operates at high efficiency 24 hours a day, seven days a week over the range of multiple tenant demands and production schedules. It has improved part-load performance and its electrical operating cost is dramatically reduced.

BONNEVILLE POWER ADMINISTRATION

Project Background

Monte Villa Farms needed a system to provide 24-hour-a-day air requirements for its multi-tenant industrial plant. Its original equipment consisted of two 125-horsepower air compressors. Baseline power metering of the existing system indicated that the actual capacity requirement of the system could be met with a much smaller compressor.

To analyze the system needs, the existing compressor motor load, system pressure and flow rates were metered for several weeks. It was determined that the average 24-hour air requirements of the system over a typical production day were approximately 6 percent of the 125-horsepower compressor's capacity or approximately 30 cubic feet per minute (cfm). Observed peak air requirements were limited in duration and rarely exceeded 120 cfm.

Project Overview

The Monte Villa compressed air system was redesigned. Some equipment was replaced and other things were added. The following changes were made:

The new 60-horsepower compressor, controls and receiver.

1) A new 60-horsepower rotary screw compressor with load/unload capacity controls replaced the existing two 125-horsepower compressors;
2) A new cycling refrigerated air dryer was installed; and
3) 1,500 gallons of additional air receiver storage volume was added.

The increased air storage and a downstream flow controller allowed system supply pressure to be reduced by 25 pounds per square inch gauge (psig), resulting in a new system supply pressure of 95 psig that met all tenant requirements.