Wal-Mart Stores, Inc.
Optical Manufacturing Plant

COMPANY BACKGROUND

Wal-Mart Stores, Inc. is a leading discount retailer selling general merchandise, groceries, and pharmaceuticals. Many retail locations also include vision centers, walk-in clinics and financial services. Wal-Mart employs 1.9 million associates worldwide in more than 3,900 stores in the United States and more than 2,700 throughout the rest of the world. More than 176 million customers visit the stores each week.

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PROJECT BACKGROUND

Four optical labs are located throughout the United States to produce prescription eyeglasses for Wal-Mart Vision Center customers. The lab in Fayetteville, AR would like to reduce energy use in the heating ventilation and air conditioning (HVAC) system, compressed air, and other energy-using equipment. Projects and changes identified at the Fayetteville lab will be implemented at the other optical lab locations.

INCENTIVES TO CHANGE

Wal-Mart Stores, Inc. has a sustainability goal to be supplied by 100 percent renewable energy, to create zero solid waste, and to sell sustainable products. Steps already taken include reducing product packaging, improving trucking fleet fuel economy, sustainable forest management, reducing energy use at facilities, and many other initiatives. This project will help reduce facility energy use and meet company goals.

RESULTS

Lighting Upgrades

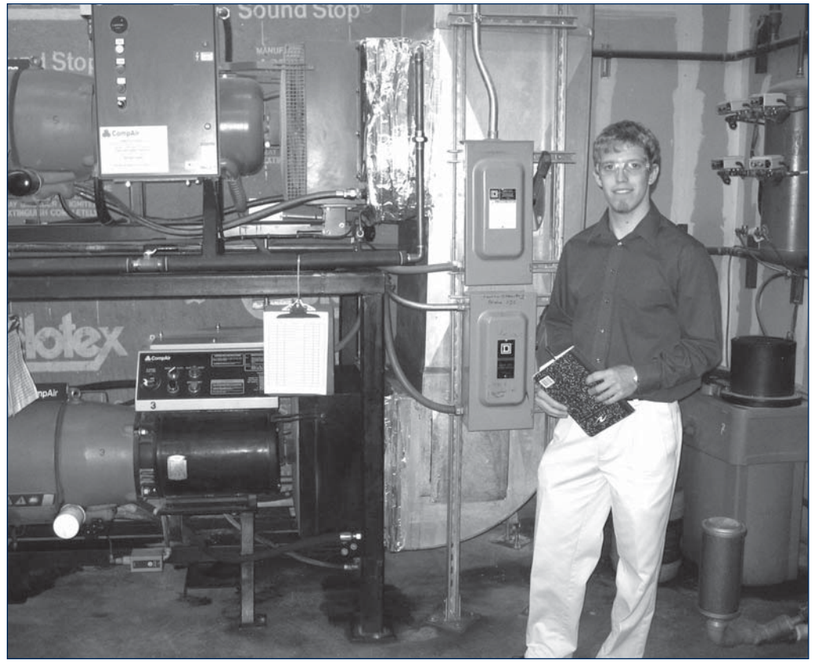
Several areas of the plant will benefit from changes to the current lighting system. Each area either uses low efficiency fixtures, has too high of a lighting level for the process, or has lights on when nobody is present. The incandescent bulbs should be upgraded to compact fluorescent bulbs, and the metal halide fixtures replaced with fluorescent for more efficient lighting. The areas with too much lighting should have fixtures removed to decrease lighting levels and minimize energy use. Areas with lights on at all hours will have occupancy sensors installed to control the lighting. Total energy savings from the project will be $4,475 annually while reducing plant energy consumption by 74,450 kWh.

Compressed Air System Improvements

There are currently four 30 HP compressors without controls supplying the plant. The desiccant dryers lose about 15 percent of the air generated, and another 110 CFM of air is lost through leaks. The distribution piping has pressure losses between 25 and 60 psi resulting in pressure too low to operate the tools.

A new 50 HP variable speed compressor has been recommended to replace two of the existing compressors. The new compressor is more efficient than existing compressors and will match the air supply and energy use to the load. The integrated compressor controller will provide redundant system control and allow other system improvements to reduce operating cost.

Energy demand will be reduced by first eliminating air leaks in the facility. A



leak detector has been recommended for purchase to continue system maintenance and to search the other labs. Additional demand savings will result from using a refrigeration type air dryer to remove moisture and a small desiccant dryer for the single-end use that requires higher quality air.

Plant pressure problems will be addressed by upgrading the air distribution piping. Another main distribution line and several branches will be added to provide a loop in the plant. Pressure drops will be minimal after the changes.

All of the changes together provide a cost savings of $52,090 annually. The system will also be more reliable and downtime caused by low system pressure will be eliminated. With the change, energy use will decrease by 630,190 kWh.

Project	Annual Cost Savings	Environmental Results	Status
LIGHTING UPGRADES	$4,475	74,450 kWh	RECOMMENDED
COMPRESSED AIR SYSTEM UPGRADE	$52,090	630,190 kWh	RECOMMENDED

Air Pollutants Diverted in Tons

	Total for all sectors
SO2	3.57
CO	0.37
NOX	1.70
VOC	0.06
PM	0.09

Green House Gases Diverted in Tons (CO2 Equivalent)

	Total for all sectors
CO2	660.64
CH4	24.84
N2O	0.33
CFCS	8.13