Case Study *- Printing Company Reduces Capital Costs by $300K*

Dual audit on large printing company allows for new equipment payback in 1.4 years reducing capital expenditures by $300K.

…eliminated the need for an additional chiller and saved $300k in capital expenditures, as well as additional operating and maintenance costs.

A large printing company retained JHFoster to perform a dual audit to evaluate and maximize their air compression and fluid cooling system processes. The intent of the study was to evaluate the efficiency of the existing air compression and fluid cooling systems and provide recommendations to improve performance, reliability, and efficiency.

CHALLENGES

The air systems audit produced two design challenges.

Fluid Cooling System

For the fluid cooling side, the issues were a lack of chiller capacity, a needed reduction in operating costs, and an increase in overall system reliability. Chiller capacity was completely utilized and with the new installation of a printing press, an additional chiller would be required. This would not only require a capital expenditure of $300,000 but also result in additional operational and maintenance costs. With the compressed air and vacuum systems and printing operations dependent upon chilled water for cooling, a failure in the chiller system would result in a partial shutdowns in plant production areas.

Compressed Air System

The compressed air system has an adequate capacity albeit operating at an inefficient level. Without the benefit of demand storage and regulation, the plant suffered from wide pressure fluctuations of approximately 25 psi. This created the need to maintain a high operating pressure on the system, resulting in higher than necessary air leakage, artificial demand and operational costs. Also, without the benefit of a central control system, the compressors were not being controlled efficiently, thus resulting in higher than necessary operational costs and the inability to effectively match horsepower to demand.

SOLUTIONS AND BENEFITS

Fluid Cooling System

After performing the fluid cooling audit, it was determined that the compressed air and vacuum systems could be separated from the chiller system. By sizing the coolers on all industrial equipment to handle warmer water, JHFoster suggested installing a dry cooler system that would not only operate the compressed air and vacuum systems effectively, but also do so without utilizing trim water.

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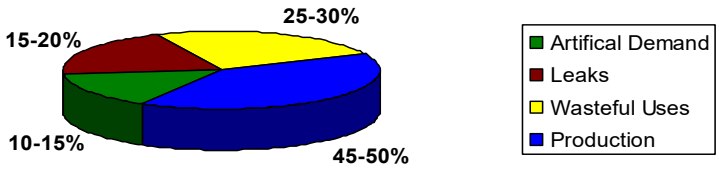

Maximum performance efficiency and reliability was achieved for large printing firm after a dual air system audit by John Henry Foster.

This resulted in the customer freeing up 120 ton of existing online chiller, more than enough to accommodate the new printing press. This eliminates the need for an additional chiller and saved $300,000 in capital expenditures, as well as additional operating and maintenance costs. With the projected new fluid cooling system in operation, the plant could save over $53,000 annually with a capital investment of $273,604. With a rebate of $75,628 from Minnesota Power, the payback for the project is under 3.5 years.

Compressed Air System

Data from the compressor air audit not only verified that no additional compressed air capacity was needed, but also identified areas to increase system efficiency. It was determined that by proper utilization of demand storage and regulation we could effectively reduce the plant pressure from as high as 113 psi to a maximum of 88 psi, eliminating the wide pressure fluctuations. The audit also provided the information needed to justify the application of a flow/pressure based centralized compressor controller to efficiently match demand to compressor online horsepower. With this information the compressed air system was designed with 3,000 gallons of storage as well as demand regulation and a flow/pressure based centralized compressor controller.

RESULTS

The compressed air system costs approximately $190,515 annually in electrical and maintenance costs. With the appropriate modifications JHFoster suggested, it is expected to save over $34,000 annually with a capital investment of $78,977. With a $29,556 rebate from a local utility to purchase the needed equipment, the return on investment in 1.4 years should be realized.

The air compressor and fluid cooling system audit helped the facility save significant amounts toward their total operating costs. From the compressed air system—fixing tagged leaks, adding dry storage tanks, steady pressure control valve, flow/pressure based compressor controller and drains, along with the fluid cooling system—installing a dry cooler system, all contributed to providing maximum performance efficiency and desired reliability.