

Performance Spotlight

Proven Tools and Practices to
Increase Industrial System Energy Efficiency

Industrial Technologies Program



San Jose Mercury News: Compressed Air System Upgrade Increases Efficiency and Saves Energy at a Newspaper Plant

Project Summary

In August 2004, the San Jose Mercury News, Inc., finished upgrading the compressed air system at its printing facility in San Jose, California. Before the upgrade project, the compressed air system's performance had become erratic and energy costs were on the rise. To improve the system's efficiency and performance, the Mercury News commissioned a system-level evaluation of the compressed air system by Air Perfection, a U.S. Department of Energy (DOE) Allied Partner. The assessment, which included an AirMaster+ analysis, was carried out by an Air Perfection employee who is also a Qualified AIRMaster+ Specialist. The final report provided AIRMaster+ estimates of potential energy savings and a system-level strategy to improve the system. This project resulted in a system with better compressor control, a lower leak load, more stable pressure levels, and improved air treatment. All these added up to better performance as well as energy savings.

Plant/Project Background

The San Jose Mercury News, Inc., a Knight Ridder company, was founded in 1851. The newspaper maintains 13 bureau offices and has a daily circulation of 263,000 readers. Circulation extends from San Francisco to Monterey. The San Jose printing plant is a 410,000-square-foot building housing approximately 1,300 employees.

The compressed air system at the San Jose facility includes six 100-horsepower rotary screw compressors. Because of fluctuating air demand patterns, the system's performance was erratic; all six compressors had to be operated at once to maintain consistent production levels. This operational pattern wasted energy and placed extra stress on end-use equipment. In the system-level review, the Qualified AIRMaster+ Specialist found that air demand patterns could be controlled by increasing the storage capacity, improving compressor controls, and installing a pressure/flow controller. In addition, he determined that air quality could be improved by adding mist-eliminator filters and that the plant's compressed air load could be reduced by fixing leaks. Plant personnel found that implementing these measures improved the performance of the compressed air system considerably. In addition to having a more consistent air supply and more stable pressure levels, the plant now needs to operate fewer compressors to satisfy its air demand.

Benefits

- Saves \$96,000 annually
- Reduces annual energy consumption by 800,000 kWh
- Improves system performance
- Achieves a 16-month simple payback

Applications

Compressed air systems are found throughout industry, and they can consume a significant portion of the electricity used by manufacturing plants. Using a system-level strategy to improve a compressed air system is the best way to enhance system performance, increase efficiency, and save energy.



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Results

The compressed air system project at the San Jose plant is yielding impressive energy savings. Measurements of the system's energy use since the project was completed indicate an annual energy savings of 800,000 kWh and a cost savings of \$96,000. These savings are consistent with AIRMaster+ estimates. After the plant received a rebate from Pacific Gas & Electric, total project costs were \$129,000. With total annual savings of \$96,000, the project yields a simple payback of approximately 16 months.

Lessons Learned

In many industrial plants that use compressed air, fluctuating system pressure is a frequent problem that is often misinterpreted as insufficient pressure. A common response is to bring additional compressors online to make up the perceived shortfall, which wastes energy. However, in most cases the pressure level can be stabilized without activating more compressors. By applying a system-level approach, industrial end-users can uncover the root cause of the pressure fluctuation and determine how to best stabilize system pressure. At the San Jose Mercury News plant, this approach uncovered several energy efficiency opportunities and led to the implementation of a project that optimized the system's efficiency and yielded significant energy savings. Furthermore, the plant was able to satisfy its production parameters while operating fewer compressors. This methodology, which relied on AIRMaster+, can be successfully applied in many types of industrial plants that use compressed air.



Dan McCain

Specialist Profile

Dan McCain is the manager of field service technicians at Air Perfection and has 29 years of experience working with compressed air systems. As an AIRMaster+ Qualified Specialist, he has been involved in dozens of successful compressed air system optimization projects that have yielded substantial energy savings. Dan has been particularly active in using AIRMaster+ to validate energy savings for local utility company rebate programs.

Qualified Specialists

Qualified Specialists are industry professionals who identify cost-cutting and efficiency opportunities in industrial plants. Experienced professionals who complete a qualification training workshop and exam for specific DOE-developed software tools receive special designations, and they can use these tools to help plants reduce costs, decrease maintenance and downtime, and improve productivity. The training recognizes and enhances a professional's expertise in the use of DOE's AIRMaster+ software tool, Pumping System Assessment Tool, Process Heating Assessment and Survey Tool, and Steam System Tools. For information, visit www.oit.doe.gov/bestpractices/software_tools.shtml.

Project Partners

San Jose Mercury News
San Jose, CA

Air Perfection
Dixon, CA

Pacific Gas & Electric Co.
San Ramon, CA

BestPractices is part of the Industrial Technologies Program, and it supports the Industries of the Future strategy. This strategy helps the country's most energy-intensive industries improve their competitiveness. BestPractices brings together emerging technologies and energy-management best practices to help companies begin improving energy efficiency, environmental performance, and productivity right now.

BestPractices emphasizes plant systems, where significant efficiency improvements and savings can be achieved. Industry gains easy access to near-term and long-term solutions for improving the performance of motor, steam, compressed air, and process heating systems. In addition, the Industrial Assessment Centers provide comprehensive industrial energy evaluations to small- and medium-size manufacturers.

A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.

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