



COLORADO INDUSTRIAL ENERGY CHALLENGE

Improving Efficiency, Reducing Costs and Emissions C

PROFILES IN INDUSTRIAL ENERGY EFFICIENCY

Quick Facts

- LOCATION: Golden, Colorado
- MARKET SECTOR: Beverage cans
- FACILITY SIZE: 1 million sq. feet; 7 production lines
- FACILITY PEAK DEMAND: 10-13 MW
- MONTHLY ENERGY CONSUMPTION: 9100 MWh
- PROJECT: Compressed air audit and upgrades
- SAVINGS: Estimated 10.6 million kWh/year, or 11% of total electrical consumption
- TOTAL PROJECT COST: \$1,413,000
- ROI: 2.1 years after estimated Xcel rebate of \$437,000
- CIEC GOAL: Under development



Compressed Air Audit at Rocky Mountain Metal Container Trims 11% off Energy Load

HIGH COMPRESSED AIR USAGE YIELDS OPPORTUNITIES

Rocky Mountain Metal Container (RMMC), a joint venture of MillerCoors and Ball Metal Beverage Container Corp, is the largest two-piece aluminum can manufacturing plant in the world. The plant has seven production lines that make cans in sizes of 8, 10, 12, and 16 ounces.

The Golden, Colorado-based plant’s utility steering committee meets monthly to assess and prioritize energy-savings opportunities. “We have a long list, and our challenge is always to free up staff time to pursue those opportunities,” says Patrick Sullivan, Manager of Tooling, Metrology and Facility Maintenance and the leader of the utility steering team.

A compressed air audit and upgrades rose to a top priority based on the high amounts of compressed air used in the manufacturing process—between 7,000 and 14,000 CFM depending on production. Compressed air is used to blow the cans off of the forms and decorator mandrels, among other uses.

To identify energy-saving opportunities, RMMC hired Blackhawk Equipment Corp. to conduct a compressed air audit, which involved onsite data gathering and data logging for about a week, followed by a report, briefings, and consultations on implementation, for a total cost of \$11,000. The audit report noted the substantial incentives available from Xcel Energy’s Self-Direct Program to help reduce the implementation costs. A post-audit will verify actual savings and help calculate the final utility incentive.

RMMC'S COMPRESSOR UPGRADES

Based on the results of the audit, RMMC is installing and fine-tuning a new 1,750 horsepower (hp) Cameron turbo compressor that replaced four inefficient 600 hp Elliott compressors; 30 necking face seal manifolds; a new control system by Bay; and a new stainless steel supply header. Each face seal manifold is reducing air consumption by 50 CFM for a total of 1500 CFM.

“There are three big advantages of new compressors,” explained Sullivan. “First are reduced maintenance costs,” expected to save RMMC \$80,000 per year with a lifetime of 15-20 years before a major rebuild. “Second is efficiency. Thirty five years ago it took 31.5 hp to produce 100 CFM; today’s compressors only require 22.7 hp to create that much—a 28% efficiency gain. Third is the turndown capability of today’s compressors, making them much more efficient in a broad range of demands,” he said.

FIRSTHAND ADVICE ON COMPRESSOR PROJECTS

RMMC offered some key lessons for others considering a similar project:

- Select a very reliable and experienced compressed air contractor.
- Ask/require the contractor to include low-cost improvements as well as recommendations for equipment upgrades.
- Make sure your transformers will handle a new or larger compressor. RMMC’s transformers needed to be rewired at a cost of \$14,000.
- Stainless steel is best for piping between the compressors, chiller dryers, and filters. Ferrous metals can rust, plugging up air filtration causing large pressure drops.
- Compressor orders can require long lead times—RMMC’s was 22 months.
- Self-direct or custom rebate programs like Xcel’s require pre-approval before anything is ordered.
- When looking at compressed air filtration, be sure to look at the normal pressure reduction through the filter. They range from as low as 2 psi to as high as 12 psi, greatly impacting overall efficiency.
- Include a 15% contingency in the proposal to account for unforeseen circumstances.

Compressed Air Audit Goals

The general goals of audits are to:

- *Document compressed air costs*
- *Identify the range of flow rates*
- *Document pressure variation throughout the plant*
- *Evaluate resulting compressor loading/unloading patterns*
- *Identify problems and root causes*
- *Evaluate options for improvements*
- *Note and discuss general maintenance, system operation, and point of use practices*
- *Show economic justification and analysis for each energy-saving measure*

More Info

A compressed air audit can reveal huge energy-saving opportunities. Attending a compressed air system training workshop can also help you identify energy-saving opportunities.

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