Ford Van Dyke:

Compressed Air Management Program Leads to Improvements that Reduce Energy Consumption at an Automotive Transmission Plant

Benefits

- Saves $165,000 annually
- Reduces annual energy consumption by more than 1 million kWh
- Increases production throughput

Applications

Almost any industrial facility can benefit from having a compressed air management program. In many cases, projects identified and implemented under such a program will reduce energy consumption and generate savings. In addition, these projects can help to improve production, reduce downtime, and trim maintenance costs.

Project Summary

Between 2000 and 2003, staff at the Ford Van Dyke Transmission Plant (VDTP) in Sterling Heights, Michigan, increased the efficiency of the plant's compressed air system. The plant has a rigorous compressed air management program that enables staff to maintain the compressed air system's efficiency and identify potential opportunities to reduce the amount of energy that the system consumes. After VDTP staff identified opportunities for system improvements, a staff member from a U.S. Department of Energy (DOE) Allied Partner, Scales Air Compressor Corporation, helped to clarify some of the opportunities in a brief walk-through. Along with some planned equipment upgrades, improvement measures were implemented to improve the compressed air system's performance, saving energy and improving production. Measures that were implemented between 2000 and 2003 have resulted in energy savings of more than 1 million kWh for compressed air, and energy and maintenance cost savings of $165,000. The total cost of the planned upgrades and other measures was $336,000, yielding a 2-year simple payback.

Plant/Project Background

In operation since 1968, the VDTP is a 1.9-million-square-foot automotive transmission plant that produces more than 9 million car and truck transmission components annually. Compressed air is important at the VDTP for many pneumatic tools, stamping equipment, blow-off applications, and counterbalance cylinders. Plant personnel consulted with Scales Air Compressor Corporation to assess the system as part of a corporate initiative to improve energy efficiency. That review confirmed the benefits of eliminating unnecessary blow-off applications and air leaks as well as moisture carry-over, which resulted from a poorly functioning dryer that was near the end of its useful life and scheduled for replacement.

After the review, VDTP personnel moved forward with their anticipated compressed air system improvements. They began by replacing the ineffective dryer and conducting an aggressive and ongoing leak repair campaign. Plant personnel then eliminated the unnecessary blow-off applications and installed flow and dew point meters to accurately gauge the volume and quality of the air being generated. These measures helped to reduce pressure drop in the system, allowing the compressor discharge pressure to be lowered from 108 to 98 pounds per square inch gauge.

Results

The continuing optimization of the VDTP's compressed air system is yielding energy and maintenance cost savings while improving production. Total annual energy savings for compressed air are 1,075,000 kWh, and annual energy and maintenance costs are lower by $165,000. Even more important, product quality and process control have improved. Between 2000 and 2003, the plant's compressed air costs per unit of production declined by 18% and production increased by 2% as a result of the greater reliability and better control of compressed air to processes. The total cost of the improvement measures implemented during that time was $336,000, which results in a simple payback of just over 2 years.

Lessons Learned

A rigorous compressed air management program that takes into account how various end-use applications within a plant use compressed air can lead to more efficient system performance and lower energy costs. An independent review validated the Ford VDTP staff's assumptions about their compressed air system's energy consumption patterns and what was necessary to enhance the system's energy efficiency. Their resulting actions did more than just save energy; they also strengthened an institutionalized management program that increased awareness about the system's energy consumption, and this led to further improvements. In addition, they realized that trending compressed air use against production levels can be very useful in documenting system performance. Compressed air management programs such as this one can easily be implemented in industrial facilities that use compressed air.

William Scales

Project Partners

Ford Motor Company
Sterling Heights, MI

Scales Air Compressor Corporation
Carle Place, NY

Partner Profile

William Scales, president of Scales Air Compressor Corporation, is an internationally recognized expert in compressed air systems. Over the last 40 years, he has visited more than 5,000 facilities and audited hundreds of compressed air systems throughout the world for a wide variety of industrial companies. He is a Qualified Instructor for the Compressed Air Challenge® (CAC) Fundamentals and Advanced Management training and was a member of the core group that developed this training. In addition, his company is a DOE Allied Partner.

CAC Instructors

The CAC qualifies instructors who are trained, certified experts in the use of compressed air systems. They are dedicated to providing industrial end-users with strategies they can implement immediately to improve the efficiency and reduce the costs associated with compressed air systems in their plants.

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