Liberty Utilities®

Air Compressor Audits Reveal Energy-Saving Opportunities

KEY POINTS

- **A compressor audit has the potential to provide immediate energy savings.**
- **Audits typically include the interaction between supply and demand.**
- **Independent auditors should provide unbiased and objective recommendations.**

Air compressors are widely used throughout industry. In many facilities, compressed air is a core function and the largest electricity user. Electricity typically represents 76 percent of the total cost of ownership.

Source: iStock.com

A compressor audit has the potential to provide immediate energy savings and a sizable impact on a company's profit. Energy savings of 30 percent can be achieved, and operating costs can be reduced by as much as 50 percent.

Other benefits of an audit include:

- Improved system reliability
- Increased productivity
- Unscheduled downtime is reduced

A circuit board manufacturer achieved annual energy savings of 742,000 kWh—a savings of $63,000 annually—after completing a system audit.

What is included in an audit?

Audits typically include an examination of both air supply and use, and the interaction between supply and demand. The output of a compressed air system, energy consumption in kilowatt-hours, and the annual cost of operating the system are calculated. The auditor also measures total air losses from leaks and locates those that are significant.

All components of the compressed air system are inspected individually and problem areas are identified. The findings are provided in a report with a recommended course of action. If considering an independent auditor, choose one who has worked at similarly sized facilities and provides unbiased recommendations.

However, before scheduling an audit, the following should be repaired:

- Clogged or damaged filters
- Major leaks, damaged regulators or lubricators
- Unauthorized modifications
- Inoperable drains

By completing this checklist of maintenance items, an external air audit may not even be needed. Without these repairs, an audit won't be successful.

Supply and demand

Improving and maintaining peak performance means addressing both the supply and demand sides of the system, by answering the following questions:

Supply side issues:

- Are the location, connection to cooling water, and ventilation adequate?
- What is the compressor's condition and efficiency?
- What is the pressure across air-inlet and lubricant filters?
- What are the aftercooler and separator efficiencies in relation to the relative humidity?
- Is the dryer size, pressure drop, and efficiency suitable for the current application?
- Is a filter needed to prevent contamination of the dryer?
- Is the receiver tank operating properly, and is it the right size?
- Is the receiver drain trap operating properly?

Demand side issues:

- Is the layout of the piping system properly designed?
- What is the pressure drop and efficiency? Is the condensate removal system adequate?
- What is the load profile under different demand conditions?
- Will advanced control strategies or storage options be needed?
- Are the equipment and processes using the compressed air appropriately?
- Can existing air compressors be replaced with blowers, vacuums or air conditioning?

Addressing the system as a whole

An understanding of the interaction of components on both the supply and demand side is essential to a successful audit and is achieved by answering the following questions:

- What is the appropriate level of air treatment for proper operation of the equipment?
- What are the air quality levels at critical points in the system?
- How large are the leaks, where are they located, and what is the best way to manage them?
- What is the lowest possible pressure level required to operate production equipment effectively?
- Is the existing control system appropriate for the system demand profile?
- What is the chemical analysis of the cooling water? Is additional treatment required?
- Are there potential applications for heat recovered from the compressed air system?

More detailed analysis may be recommended if a system is poorly designed, in unsatisfactory operating condition, or in need of a substantial retrofit.

The Compressed Air Challenge offers free analysis software and other useful information.

ENERGY SAVINGS HIGHLIGHT

With a audit, energy savings of 30% can be achieved, and operating costs can be reduced by as much as 50%.

Liberty Utilities

- may fund a portion of the cost of an energy audit study
- provides incentives on energy savings improvements
- may require pre-approval of the audit and incentives

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