Suggested Actions

- Review the compressed air applications to determine which ones are valid high-pressure and which ones can operate at lower pressures. The ones that can operate at low pressure could be supported with alternative methods.
- Consider a professional compressed air system evaluation. Such an exam could determine what applications could be served more efficiently and which appropriate alternative applications could replace them.

References

From Compressed Air Challenge® (CAC):

The Compressed Air System Best Practices Manual, Guidelines for Selecting a Compressed Air System Service Provider

From DOE's Industrial Technologies Program and CAC:

Improving Compressed Air System Performance: A Sourcebook for Industry

Training

- *Fundamentals of Compressed Air Systems* – 1 day
- *Advanced Management of Compressed Air Systems* – 2 days

Offered by the Compressed Air Challenge; for the latest course schedule and locations see *www.compressedairchallenge.org*

For additional information on industrial energy efficiency measures, contact the EERE Information Center at 1-877-337-3463 or visit the BestPractices Web site at www.eere.energy.gov/industry/bestpractices.

Alternative Strategies for Low-Pressure End Uses

Compressed air is expensive to produce. Because compressed air is also clean, readily available, and simple to use, it is often chosen for applications in which other methods or sources of air are more economical. To reduce compressed air energy costs, alternative methods of supplying low-pressure end uses should be considered before using compressed air in such applications. Many alternative methods of supplying low-pressure end uses can allow a plant to achieve its production requirements effectively.

Before deciding to replace a low-pressure end use with an alternative source, it is important to determine the minimum practical pressure level required for the application.

Alternative Applications to Low-Pressure End Uses

Existing Low-Pressure End Use	Potential Alternatives	Reasoning
Open blowing, mixing	Fans, blower, mixers, nozzles	Open-blowing applications waste compressed air. For existing open-blowing applications, high efficiency nozzles could be applied, or if high-pressure air isn't needed, consider a blower or a fan. Mechanical methods of mixing typically use less energy than compressed air.
Personnel cooling	Fans, air conditioning	Using compressed air for personnel cooling is not only expensive, but can also be hazardous. Additional fans or an HVAC upgrade should be considered instead.
Parts cleaning	Brushes, blowers, vacuum pumps	Low-pressure blowers, electric fans, brooms, and high-efficiency nozzles are more efficient for parts cleaning than using compressed air to accomplish such tasks.
Air motors and air pumps	Electric motors, mechanical pumps	The tasks performed by air motors can usually be done more efficiently by an electric motor except in hazardous environments. Similarly, mechanical pumps are more efficient than air-operated double diaphragm pumps. However, in an explosive atmosphere and/or the pumping of abrasive slurries, the application of a double diaphragm pump with appropriate pressure regulating and air shut-off controls may be appropriate.

Case Study: Low-Pressure End Uses are Replaced with Alternative Applications

A bottling plant was using compressed air in some applications that could be better supported with less energy-intensive methods. The plant was cooling and hardening bottlenecks by blowing cool, compressed air on them. Also, some of the blow mold machines were continuously blowing compressed air through air jets onto the preform feed lines to prevent them from jamming. Lastly, the plant's stackers in the packaging area were using compressed air-operated venturi vacuum producers to pick up and position dividers between layers of bottles. To cool the bottlenecks, the application of a small blower that would blow cool air from chilled water was

recommended. The installation of an electromechanical vibrator was identified as the best way to prevent the feed lines from jamming. Finally, a central vacuum system having energy costs that were 30% lower than that of the venturi devices was shown to be as effective as the existing system. The annual compressed air energy savings from implementing these simple modifications was $80,000.

About DOE's Industrial Technologies Program

The Industrial Technologies Program, through partnerships with industry, government, and non-governmental organizations, develops and delivers advanced energy efficiency, renewable energy, and pollution prevention technologies for industrial applications. The Industrial Technologies Program is part of the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy.

The Industrial Technologies Program encourages industry-wide efforts to boost resource productivity through a strategy called Industries of the Future (IOF). IOF focuses on the following eight energy and resource intensive industries:

- Aluminum
- Chemicals
- Forest Products
- Glass
- Metal Casting
- Mining
- Petroleum
- Steel

The Industrial Technologies Program and its BestPractices activities offer a wide variety of resources to industrial partners that cover motor, steam, compressed air, and process heating systems. For example, BestPractices software can help you decide whether to replace or rewind motors (MotorMaster+), assess the efficiency of pumping systems (PSAT), compressed air systems (AirMaster+), steam systems (Steam Scoping Tool), or determine optimal insulation thickness for pipes and pressure vessels (3E Plus). Training is available to help you or your staff learn how to use these software programs and learn more about industrial systems. Workshops are held around the country on topics such as "Capturing the Value of Steam Efficiency," "Fundamentals and Advanced Management of Compressed Air Systems," and "Motor System Management." Available technical publications range from case studies and tip sheets to sourcebooks and market assessments. The Energy Matters newsletter, for example, provides timely articles and information on comprehensive energy systems for industry. You can access these resources and more by visiting the BestPractices Web site at **www.eere.energy.gov/industry/bestpractices** or by contacting the EERE Information Center at **877-337-3463** or via the Web at **www.eere.energy.gov/informationcenter/.**

BestPractices is part of the Industrial Technologies Program Industries of the Future strategy, which helps the country's most energy-intensive industries improve their competitiveness. BestPractices brings together emerging technologies and best energy-management 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.

FOR ADDITIONAL INFORMATION, PLEASE CONTACT:

EERE Information Center
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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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