

A New Air Style

This article first appeared in IMPO's [March 2013](#) [1] issue.



The mission of CAGI (Compressed Air and Gas Institute) is to be the united voice of the compressed air industry, serving as the unbiased authority on technical, educational, promotional, and other matters that affect the industry. IMPO recently spoke with Rick Stasyshan, CAGI's Technical Consultant, about ways the organization can help manufacturers become safer and more efficient users of this resource.

How has the CAGI SmartSite been able to address compressed air-related training gaps facing some manufacturers?

The CAGI SmartSite was a collaborative effort of our member companies that contributed to provide an on-line compressed air training tool. The SmartSite is targeted to multiple audiences that includes but is not limited to compressed air users, distributor support teams, and the member company employees. The SmartSite is an introduction to the compressed air markets, applications, and understanding how the basic elements of a compressed air system work together. It is a great starting tool to understand compressed air, industry's 4th utility.

The Introduction to Compressed Air Systems offers eight modules that provide education about various aspects of compressed air systems:

- Compressed Air Basics
- Types of Compressors
- Capacity Controls
- Distribution Systems
- Controlling Wastes
- Air Treatment
- Compressor Installation & Air System Maintenance
- Integrally Geared Centrifugal Compressors

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The benefits are numerous:

- Users better understand how to maximize their air system efficiency.
- They learn about the do's and don'ts of compressed air systems.
- Maintenance tips are offered to maximize the economic returns and reliability of the system.
- It allows the participant to review and progress through the various modules at a pace that accommodates today's busy individual schedules.
- The on-line training is available 24/7.
- Participants can choose to attend sessions at home or at the office and at their own pace.
- Registration allows for a full year access to use as a refresher or resource.

What are some of the biggest problem areas for plants when it comes to the efficient (or inefficient) use of compressed air?

The most expensive component in the total cost of compressed air is energy. In fact, over the lifespan of a typical compressor, energy typically costs several times more than the purchase price of the compressor. The bottom line, maximizing energy efficiency saves you money.

Our members and our members' distributors continue to emphasize this very point with their users every opportunity they get. Every member training session, every one of our member's websites, and their literature calls attention to the opportunity to improve energy performance of compressor systems.

The obvious first step to reduce compressed air energy costs is to measure and monitor your compressed air system's energy consumption, flow rates, and operating air pressure. Small adjustments can reduce your operating pressure and energy costs while improving flow rates and output. Our members are passionate about this message and have highlighted these and other key points on the CAGI website: www.CAGI.org [2]. Here are 10 steps you can take to optimize your compressed air system and save energy costs.

1. Turn It Off. There are 168 hours in a week, but most compressed air systems only run at or near full capacity between 60-100 hours. Depending on your shift pattern, turning your compressors off during the evenings and weekends could reduce your energy bills up to 20 percent.
2. Fix Existing Leaks. A quarter-inch air leak at 100 psi will cost you more than \$2,500 a year. Pipe systems older than five years can have leaks of up to 25 percent. Because it takes energy to generate compressed air, any air that leaks is money wasted. Approximately 80 percent of air leaks are not audible, so to minimize these problems, third-party help in detecting these leaks may be a necessity.
3. Prevent New Leaks. As Benjamin Franklin said, "An ounce of prevention is worth a pound of cure." So, be proactive and look inside your piping system. A clean, dry pipe indicates good quality air and no corrosion issues. Dust in

the pipe is caused by particles in the compressed air. If compressed air is not filtered, or if the filter is clogged, pressure drops will occur and the risk of end product contamination will increase. Sludge in the pipe is bad news and must be fixed immediately. Dust and sludge in a compressed air piping system will cause corrosion very quickly and will greatly increase the number of leaks. Dried and filtered compressed air keeps piping clean.

4. **Reduce Pressure.** Run at required pressures, not beyond. Each two psig reduction cuts energy consumption one percent. Check the system pressure and resist the urge to turn up the pressure to compensate for leaks or drops in pressure due to piping problems or clogged filters. A central supply side controller can greatly reduce the operational pressure band and orchestrate air production much more efficiently and effectively.
5. **Check Drains.** Are your condensate drains stuck open? Condensate drains on timers should be adjusted periodically to ensure they open as intended or aren't stuck open. Better yet, replace timer drains with zero-loss drains to stop wasting compressed air.
6. **Review Piping Infrastructure.** Many systems aren't optimized. A piping system design should optimize transfer of compressed air at the desired flow and pressure to the point of use. Increasing the size of a pipe from two to three inches can reduce pressure drop up to 50 percent. Shortening the distance air has to travel can further reduce pressure drops by about 20-40 percent. The more flow through a pipe, the greater the pressure drop will be. Pressure drop in a pipe increases with the square of the increase in flow, which means if the flow is doubled, the pressure drop will increase four times. Air distribution piping should be large enough in diameter to minimize pressure drop.
7. **Change Filters Systematically.** Not every once in a while. Inspect and replace filters systematically to ensure the quality of your air and prevent pressure drops. Go beyond the air compressor and compressor room. There are several air-line and point-of-use filters within the facility. Those are just as important to maintain as the air compressor and air compressor room filters.
8. **Recover Heat.** Compressing air generates heat - reuse it! It's simple physics that compressing air gives off heat, and as much as 90 percent of that heat can be recovered for use in your operation. For example, you can produce hot water for washrooms or direct warm air into a workspace, warehouse, loading dock, or entryway. The savings can really add up.
9. **Emphasize Proper Maintenance.** Ignoring maintenance costs more. As with most industrial machinery, a compressor runs more efficiently when properly maintained. Proper compressor maintenance cuts energy costs around one percent and helps prevent breakdowns that result in downtime and lost production. Protect your reputation and profits with proper maintenance.
10. **Identify and Eliminate Inappropriate Uses of Compressed Air.** Inappropriate uses of compressed air include any application that can be done more effectively or more efficiently by a method other than compressed air. For example, high pressure air often is used for cooling or applications where much lower air pressure is required.

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What are some of the big picture issues CAGI is looking at addressing in the future?

Our mission really answers this question very concisely. CAGI's mission is to be the united voice of the compressed air industry, serving as the unbiased authority on technical, educational, promotional, and other matters that affect the industry. CAGI fulfills its mission through its objectives. The following objectives are addressed through CAGI's resources such as the CAGI website, standards, CDs, online training, and collaboration with other industry organizations.

- To promote cooperation among its members for the improved production, proper use, and increased distribution of air and gas compressors and related equipment. We know that there are users employing bad practices. Our goal is to educate as many users as possible.
- To develop and publish standards and engineering data for air and gas compressors and related equipment. Our members are committed to providing the data to our users so they can easily and truly make an "apple to an apple" comparison of compressor performance.
- To increase the use of compressed air, to promote its safe use, and to improve the quality and efficiency of compressed air systems. Compressed air is a dependable, flexible, and reliable power source for industry. The members are committed to working with users to find and employ compressed air to enhance user productivity, open up new markets, and assure safety and health of our users employees.
- To collect and distribute information of value to CAGI members and to the general public.
- To engage in cooperative educational and research activities.
- To cooperate with governmental departments and agencies and other bodies in matters affecting the industry. Our organization and its members monitor all the various regulatory organizations worldwide. We stand ready to assist those organizations with our input and provide the full cooperation in implementing any programs as well as educating the users of the requirements.

How does CAGI integrate the expertise and resources of its members to help improve its vantage point as an industry resource?

We eat that elephant "one bite at a time". Many of the Compressed Air and Gas Institute's activities are carried out in its separate sections, which are organized by product type. Individual member companies may be affiliated with one or more of the sections, depending upon their product lines. The current sections are Air Drying and Filtration, Blower, Centrifugal Compressor, Pneumatic Tool, Rotary Positive Compressor, and Reciprocating Compressor. In addition, important issues that relate to the entire compressed air system are addressed in our standing committees, including the Educational and Promotional/Marketing Committee, the System Assessment Section, and the Standards Committee.

The scope and responsibilities of these committees that address topics of broad concern to the industry are described below:

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Educational and Promotional/Marketing: The Educational and Promotional Marketing Committee coordinates the preparation of literature and videos that provide the industry and public with information about the compressed air and gas industry and the individual sections of the Institute. These materials help to stimulate the markets for member companies' products by communicating the capabilities and benefits of air and gas compressors, blowers, dryers, and pneumatic tools. Among the responsibilities of the committee are the continual review and updating of the Institute library of technical literature, including the industry's reference manual, The Compressed Air and Gas Handbook.

System Assessment: The System Assessment Section works to enhance the energy efficiency and performance of compressed air systems. CAGI is a founding sponsor of the Compressed Air Challenge (CAC) and a Department of Energy Allied Partner. The CAC is a public/private initiative fostered by the Department of Energy to serve as a resource to help industry achieve energy savings and to increase the effectiveness of compressed air systems. The System Assessment Section oversees CAGI's efforts to improve compressed air system effectiveness and efficiency and guides the institute's cooperative activities with DOE and CAC. These activities include development and organization of compressed air system training programs, and production and distribution of educational materials to benefit compressed air system users.

Standards: The Standards Committee's objective is to coordinate the development of standards in each section and to participate in the review and publishing process. This process ensures that CAGI scope products entering commerce are tested and perform to established uniform minimum levels for user satisfaction and protection. CAGI maintains close liaison with other bodies concerned with standards, including ISO, PNEUROP in Europe and ANSI, ASME and other industry groups in the United States.

Are there any new standards that manufacturers should be looking out for in the coming years?

We couldn't get this far into an interview without realizing that energy consumption and energy efficiency of compressed air systems will be the motivating driving force of any future standards. The beauty of CAGI is that its member companies understand and embrace the efficient and safe use of compressed air; therefore, the Standard's Committee work maintains its focus with our member companies' engineering teams. Our Standards Committee and System Assessment Section are working to stay ahead of the potential changes and make sure, collectively, that our members and their distributors are informed, prepared, and compliant as new standards develop.

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[1] [http://e-conditionsbyfry.com/Olive/ODE/IMP/Default.aspx?href=IMP/2013/03/01&?&?](http://e-conditionsbyfry.com/Olive/ODE/IMP/Default.aspx?href=IMP/2013/03/01&?)

[2] <http://www.CAGI.org>