

Case Study

# Leak-Detection Survey Leads to Significant Savings



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## Opportunity

A careful examination of a facility's compressed air system often reveals opportunities to reduce costs and environmental impact. Significant savings can be derived by diminishing the plant's energy draw. As well, opportunities to lower operating, maintenance, and repair costs are frequently identified. Many industries have ignored these problems for years, citing cheap energy sources, but today, an understanding of total cost of ownership is imperative to saving money. For example, a single leak in a 1/4-inch compressed air line can cost a facility anywhere from \$2,500 USD to more than \$8,000 USD per year<sup>1</sup>, depending on pressure and energy costs.

When leaks and inefficient flow are accounted for, energy waste becomes staggering. Accepted industry estimates indicate the value of wasted energy due to poorly designed and maintained compressed air systems in North America could be as high as \$3.2 billion annually.<sup>1</sup>

Our customer, a natural gas processing plant, realized the value of revenue lost to compressed air leaks and saw Swagelok Fluid System Evaluation and Advisory Services™ as an opportunity for change. The consultation helped the customer better understand their options ahead of a large decision on capital outlay to improve the condition of their utility air system.



<sup>1</sup> Compressed Oil and Gas Institute, *Working with Compressed Air*.  
<https://www.cagi.org/working-with-compressed-air/benefits/cost.aspx>

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## Challenges

Our customer is one of the largest natural gas processing plants in Alberta, Canada. Key operations include sour gas treating, co-stream processing, plus natural gas liquids extraction and fractionation.

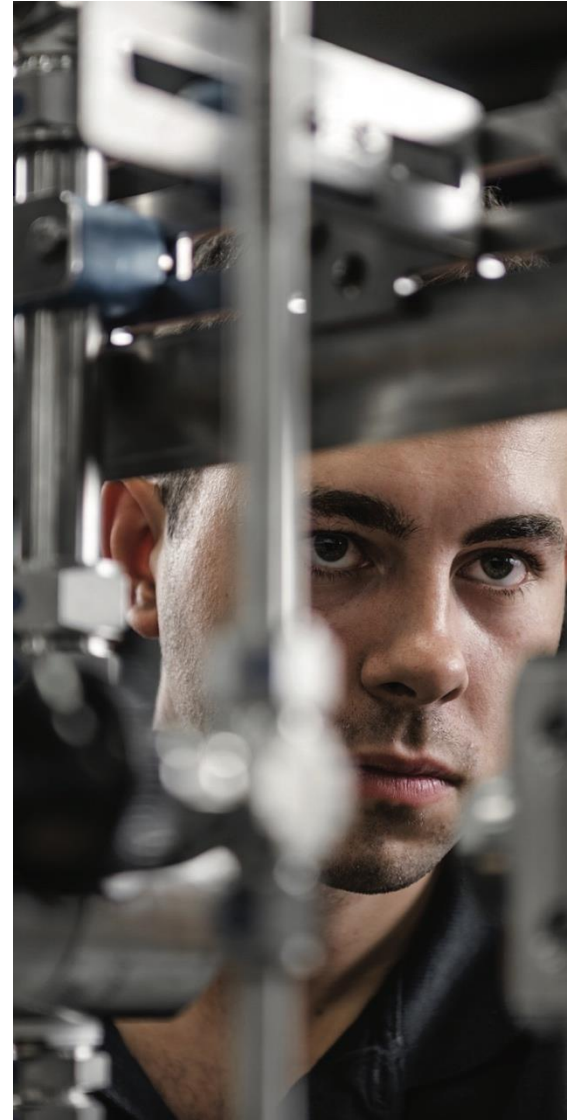
The customer was troubled by frequent low-level alarms and a constant struggle to maintain air pressure at the point of use, particularly in those areas furthest from the compressor. Our initial meetings with the customer indicated the potential for leakage and inefficiencies throughout the plant's utility air system. Swagelok's field engineer noted two plausible causes:

- The plant was suffering from unrealized inefficiencies, such as leaks, artificial demand, or practices not aligned with industry standards; or
- Real plant demand had exceeded the capacity of the existing compressor

Faced with the critical decision of a large capital investment for an additional compressor package, our customer agreed to an evaluation of its utility air system.

## Approach

Swagelok Fluid System Evaluation and Advisory Services deployed a team of four fluid system experts to conduct an eight-day compressed air leak-detection audit at our customer's facility. Leveraging years of application experience and a suite of specialized, sensitive equipment, the team's mission was to survey/test, identify, and tag all leak points throughout the facility's utility and breathing air systems. At the conclusion of the audit, the team surveyed and tested over 12,000 tube fitting connections and more than 3,000 pipe fitting connections.



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## Results

We generally classify leaks into three categories of severity: minimum, moderate, and major. Our equipment allows us to quantify leaks by their decibel output and calculate a leak rate in cubic feet per minute (CFM). Then, using a few formulas and calculations, we provide the total quantitative impact to the customer. Of the more than 15,000 connection points, our team identified and tagged over 800 leaks— with over 150 classified as major. Eliminating these leak points reduced annualized cost by approximately \$242,000, as summarized in our 60-page audit report. Provided with the raw data on gross leakage (CFM), our customer was able to confidently eliminate the requirement for an additional compressor/dryer package (conservatively estimated at a \$250,000 cost savings). The customer resolved the issue of low-level alarms actuating and restored adequate air to all areas of the plant.

The results we helped the customer obtain led us to survey the breathing air system and identify additional leak points. The timing of this effort, ahead of a scheduled plant turnaround, saved the customer from a potential safety incident or untimely downtime due to a system failure.

Finally, we identified that many of the leaks were caused by preventable installation errors. We introduced Swagelok Essentials Training which reinforced the importance of safe, correct installation of tube fittings and pipe fittings, yielding additional efficiencies across the plant's maintenance and operations.

Connections Tested  
**15,000**

Leaks Identified  
**800+**

Annualized Cost Savings  
**\$242,000**

Cost Avoidance from Eliminating  
Compressor Requirement  
**\$250,000**

Total Customer Cost Savings  
**\$492,000**

**Contact your local sales and service center to learn more. [www.michigan.swagelok.com](http://www.michigan.swagelok.com)**