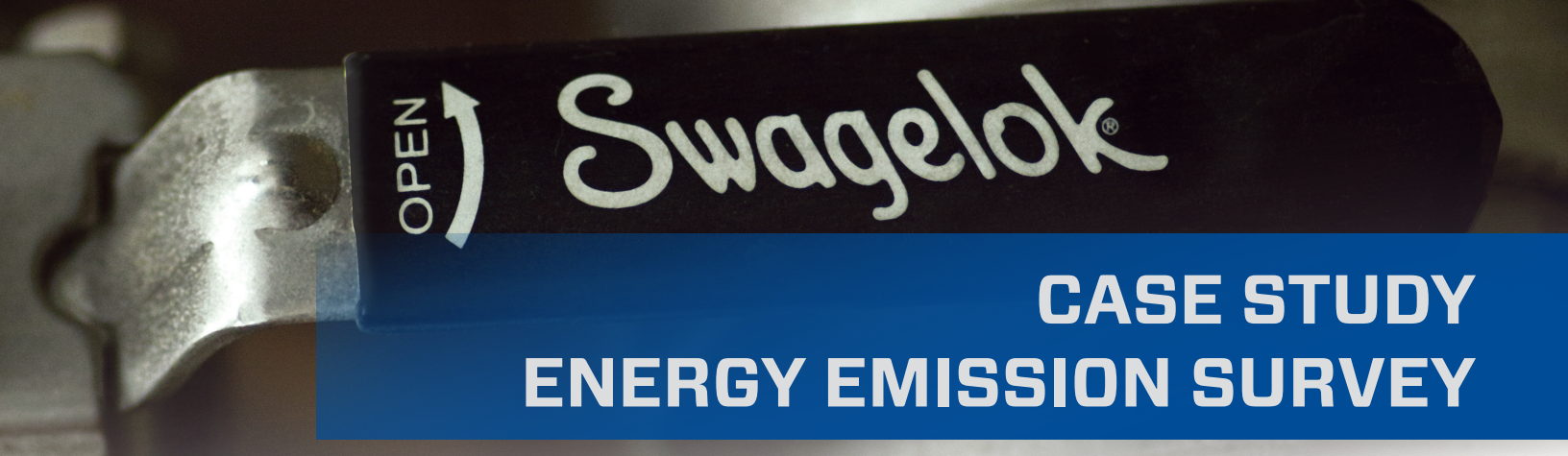


CASE STUDY ENERGY EMISSION SURVEY



A close-up photograph of a metal component, likely a valve or fitting, with a black label. The label features the word 'OPEN' in white capital letters next to a white curved arrow pointing to the right. To the right of the arrow is the 'Swagelok' logo in a white, stylized script font.

OPEN

Swagelok®

CASE STUDY ENERGY EMISSION SURVEY

Executive Summary

A careful examination of a facility's compressed air system will likely reveal several opportunities for reducing the plant's energy draw, resulting in a significant energy savings, lower operating costs and a minimized impact on the environment, not to mention the additional savings in maintenance and repair. 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 \$2500 to more than \$8000 per year, depending on pressure and energy costs.

Our customer had heard of the success of our Swagelok Evaluation & Advisory program, and was happy to receive our consultation to better understand their options ahead of a large decision on capital outlay to improve the condition of their utility air system.

About the Customer

Our customer is one of the largest gas plants in Alberta with natural gas processing consisting of sour gas treating, co-stream processing, and natural gas liquids extraction and fractionation.

Scope of Supply

Swagelok Evaluation & Advisory Service
- Compressed Gas Leak Detection Survey



The Challenges

Compressed air is one of the principal forms of energy used in industrial processes - it is vital to operate the tools and equipment that keep the plant on-line and processing to capacity. Due to the simplicity of generation, compressed air is commonly accepted as an industrial facility's Fourth Utility - behind water, electricity, and natural gas - and is a utility that is often taken for granted. 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 approximately \$3.2 billion annually. Where otherwise ignored, our customer began to understand the value of their Fourth Utility, and saw Swagelok Evaluation & Advisory Services as an opportunity for change.

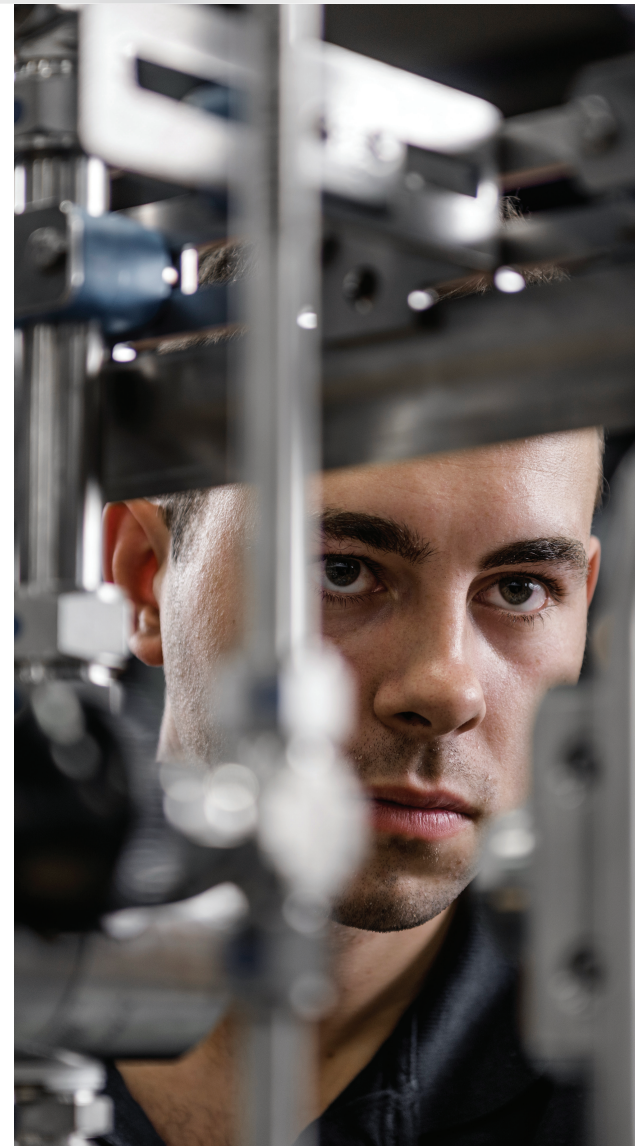
Our initial meetings with the customer indicated the potential for leakage and inefficiencies throughout the plant's utility air system. Frequent 'low level alarms' and the constant struggle to maintain air pressure at the point of use, particularly in areas of the plant furthest removed from the compressor, led us to a summation of two plausible causes. Either a) the plant was suffering from unrealized inefficiencies (leaks, artificial demand, poor practices, etc.) or b) the 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 the evaluation of their utility air system.

The Solution

As part of the Swagelok Evaluation & Advisory Service, we deployed our Energy Emission Specialist and a team of three additional support personnel 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 any and all leak points throughout the facility's utility and breathing air systems. At the conclusion of the audit, the team has surveyed/tested over 12,000 tube fitting connections and more than 3000 pipe fitting connections.

The Results

We typically classify leaks by severity in three categories - minimum, moderate and major. Our equipment allows us to



Connections Tested
15,000

Leaks Identified
800+

Annualized Cost Avoidance
\$242,000¹

Compressor Requirement
Eliminated
\$250,000¹

Total Customer Cost Savings
\$492,000¹

¹Cost savings represented as approximate values based on actual report data. Total savings will vary based on number of leaks, size of leaks, orifice size, cost of electricity, operating hours and other factors. The data displayed here does not take into account maintenance costs as part of total savings.



quantify leaks by their decibel output and calculate a leak rate in CFM. Then, using a few formulas and calculations, we're able to provide the total quantitative impact to the customer facility. Of the more than 15,000 connection points, our team was able to identify and tag over 800 leaks - with over 150 classified as major - at an annualized cost avoidance of approximately \$242,000, summarized in our 60-page audit report. Furthermore, armed with the raw data on gross leakage (CFM), our customer was able to confidently disqualify the requirement for an additional compressor/dryer package (conservatively estimated by the customer at a \$250,000 cost savings), as well as resolve the issue of 'low level alarms' and restore adequate air to all areas of the plant.

As a result of the momentum we carried with the energy survey, and due to the progressive, forward-thinking of our customer, we also surveyed the breathing air system. In doing so we were able to identify additional leak points in this critical system which proved timely ahead of a scheduled plant turnaround later this spring, saving the customer from a potentially bigger issue.

We also utilized the opportunity to leverage our Swagelok Essentials Training to reinforce the importance of safe, correct installation of tube fittings and pipe fittings, in order to promote additional efficiencies across the plant's maintenance and operations.



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