EMERSON

ASK THE EXPERT

Automated Steam Trap Monitoring to Support Your Life Sciences Sustainability Goals

JOEL LEMKE

Senior Business Development Manager for Pervasive Sensing technologies, Emerson

Due to its very nature, the life sciences industry seems a natural place to expect substantial sustainability advances. Not only do these initiatives help companies and their suppliers be more environmentally friendly, but they also help them save money.

One area that has become a focus for improvement is steam trap maintenance.

Joel Lemke, Senior Business Development Manager for Pervasive Sensing technologies at Emerson and an AEE Certified Energy Manager, shares his thoughts about sustainability in the life sciences industry. With over 30 years of experience in the application of pressure, flow and acoustic measurements and an emphasis on utility systems, his expertise has long centered on steam trap monitoring. He discusses how implementing a proper steam trap monitoring system can benefit a customer directly through energy savings and additional benefits.

How can automating steam trap maintenance reduce a company's energy usage, help it reach its sustainability goals, and improve reliability and quality at its facility?

A: It's interesting how many dimensions of an operation can be positively impacted by improving steam trap maintenance. What is probably obvious to many readers is that you can reduce wasted steam and thereby lower your energy costs and carbon footprint by responding to leaking traps in a more timely manner. However, the traps impact many other areas. One major manufacturer of pharmaceuticals told us their system reduced the maintenance costs of replacing pump seals. Water hammer in their condensate return had been causing premature failure of the seals. Once the traps were healthier, this problem has been greatly reduced.

Importantly for the life sciences industry, steam is often responsible for heating a component or end product to a carefully controlled temperature. If key steam traps have failed in a closed position, water or non-condensable gases can be trapped with the steam, thereby lowering its temperature. This can cause a product to be improperly heated and lead to expensive scrap or rework — maybe a whole batch worth hundreds of thousands of dollars or more has to be discarded. Traps with this potential impact should be categorized as "critical". These are great candidates for automatic steam trap monitoring, along with high-capacity traps with significant leak rates if they fail open. The capability to automate the inspection of these critical steam traps helps to ensure sustainability, product quality, throughput and other goals are met.

Sponsored by

EMERSON

pharma MANUFACTURING
THE DRUG INDUSTRY'S VOICE FOR MANUFACTURING EXCELLENCE

How do you calculate and predict the return on investment (ROI) of a steam trap system?

A: There's a well-established formula called Napier's equation for calculating the losses from a trap based on its internal orifice size and operating pressure. With an estimate of steam cost and annual trap failure rate, we can determine the energy savings and, if relevant to the site, savings in carbon credits. This can be compared to the cost of deploying an automated monitoring system, which results in an expected return on investment. Many systems pay for themselves in just a year or two.

For life sciences in particular, what else should manufacturers consider concerning when deploying this technology?

A: Keep in mind that the ROI above is based just on energy and carbon costs. It's so important to remember that the steam system plays a crucial role in the drug manufacturing process. It can directly impact the quality or throughput they achieve. It can impact maintenance activities and even adversely affect safety — think of damaging water hammer events that can happen if a steam system is neglected. These factors can be just as important as sustainability, although they are harder to calculate.

In life sciences, what best practices has the industry uncovered?

A: Estimating the return on this potential investment is key so you can compare it to other initiatives you may be considering. Also, remember that the WirelessHART® technology (an industry-standard communication protocol) described is leverageable across many other domains. Most of these automatic steam trap monitoring systems expand into myriad directions because WirelessHART networks support dozens of other kinds of data gathering (pressure, temperature, level, flow, gas detection, vibration, discrete, etc.). Justifying an investment is easier if you can leverage the infrastructure from one area into others. For instance, the steam trap monitoring network can be used to support a rotating equipment health program by adding vibration transmitters where there is already network coverage.

How can Emerson help a customer wishing to implement a steam trap monitoring solution?

A: As previously mentioned, we can perform an ROI analysis that helps identify the most critical traps. We provide training and engineering services for all phases of system implementation. We also offer a full line of steam traps to replace the faulty ones that are identified by the automatic monitoring system. Beyond that, Emerson does many things to help manufacturers in the life sciences industry improve sustainability.

What's an example of a solution that users can get up and running quickly and easily?

A: The Rosemount™ 708 Wireless Acoustic Transmitter with Plantweb Insight™ Steam Trap Application is a three-part system that senses the state of a trap, reliably communicates this via the WirelessHART protocol, and interprets the sensor data into a convenient dashboard that classifies any style or manufacturer of the trap into its proper state (good, blow through, plugged, inactive, etc.). Plantweb Insight allows you to track and report performance to energy and sustainability goals, send alerts, and integrate with enterprise systems for work orders or other analytics tools.

Where can I find more information?

A: Discover more about the benefits of steam trap monitoring from an industry leader in wireless measurement technology by visiting Emerson.com/IndustrialWireless.