

# Productivity Improvement with Wireless Steam Trap Monitoring

## RESULTS

- Reduced energy use by minimizing steam blow-through and/or blocked flow
- Improved productivity by eliminating preventative maintenance (PM) activities on steam traps
- Reduced mechanical/asset failures by minimizing water-hammering



## APPLICATION

Steam trap wireless monitoring

## CUSTOMER

Major Food Manufacturer in the Southeast United States

## CHALLENGE

A major food manufacturer in the United States drives innovation in all areas of their business, while maintaining the highest quality in their products, services, and relationships. For the food product's plant in the southeast, innovation extends to process instrumentation and control. "We are always looking to improve energy use," said the Project Engineer who provides project and maintenance services in the utility area of this plant. "This is a large plant with multiple product lines which are run as individual business units from a cost perspective. We want to know the energy use for each business unit over time, and compare them. In that way, we can make continuous improvements to the areas that need it the most."

Steam traps were identified as one culprit of energy loss. When a steam trap fails open, steam is not completely consumed and is blown directly into the condensate return system, where it may be lost to the atmosphere in an "open system." It also can raise the pressure in the condensate system, inhibiting the discharge of other traps, causing system-wide inefficiencies. If it fails closed, the system will flood, causing a loss of heat transfer and subsequent loss of production. Steam trap failures also increase the potential for water-hammer that may lead to equipment damage and downtime.

In an effort to prevent steam trap failures, a preventative maintenance schedule was developed. With close to 100 traps in the plant, PM could only be performed once per year. It takes the maintenance crew at least one hour per unit to check the steam traps, when done properly, so maintenance labor on the traps was 100 hours annually.

"When I heard about the acoustic transmitter from Emerson, I wanted to try it out," the customer said. "We were looking for automatic, on-line monitoring of steam trap performance and real-time alerts to minimize preventative maintenance (PM) requirements and minimize energy losses. This new innovation from Emerson seemed like a good fit, and we were glad to test it."

***"We found 22% of our traps needed to be replaced during our last PM check. By installing wireless acoustic transmitters, the plant will prevent steam loss with early detection of steam trap failure. Not only will this minimize energy loss, but it will free up maintenance to focus their time and attention on things that need to be fixed, to further improve our productivity."***

Project Engineer  
Major Food Manufacturer in the U.S.

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### SOLUTION

A self-organizing, wireless network with wireless 3051S DP flowmeters had already been installed to monitor compressed air flow to the various business units in the plant, to understand the electrical energy use. Adding the non-intrusive wireless acoustic measurement device was easy, and saved a lot of money in installation cost. "Wireless greatly reduces installation cost," said the customer, "and we use those savings to purchase more instrumentation to extend utility monitoring in our plant."

For steam trap monitoring, nine 708 Rosemount Wireless Acoustic Transmitters (with integrated sensors that mount externally) were installed on steam lines throughout the plant and integrated into the existing Smart Wireless Gateway, which communicates to a plant host. The steam traps range from thermostatic (TT) to float and thermostatic (FT) to simple bucket traps, and the acoustic transmitters work equally well on all of them. One application is even a steam driven pump, where the acoustics of the pump are being monitored to give early indication of problems. The network was easy to expand, and the new transmitters just strengthened the mesh. They have a lot of concrete between the transmitters and the gateway, and high EMF, but the wireless communications are strong and reliable.

The 708 transmitter, with an industry-leading combination of temperature measurement and acoustic "listening," gives unparalleled visibility into steam trap states. "Manual monitoring of temperature did not give us enough information to conclusively target a steam trap for replacement when we saw water-hammering," the project engineer continued. "But when we installed the wireless acoustic transmitter, we could tell immediately which steam trap was stuck." It was quickly fixed, and a trend of the new trap showed normal acoustics and temperature.

Now the plant has real time alerts for each of the nine steam traps with wireless acoustic transmitters. Some are in "wash down" areas, and one is in a high humidity environment. All are communicating reliably. Because of the design of this device, the customer can "set and forget" each of the acoustic transmitters, and eliminate manual PM activities.

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*The 708 Rosemount Wireless Acoustic Transmitter features integrated sensors that mount externally to make installation fast, inexpensive, and non-intrusive to the process.*



### RESOURCES

#### Emerson Process Management Food and Beverage Industry

<http://www.emersonprocess.com/foodandbeverage/>

#### Rosemount 708 Wireless Acoustic Transmitter

<http://www2.emersonprocess.com/en-US/brands/rosemount/Wireless/708-Acoustic/Pages/index.aspx>

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