

HRSG Tube Leak Detection Using Acoustic Wireless Technology

RESULTS

- Gives early insight into leak detection to prevent further tube damage
- Allows for proper scheduling of an outage – fewer forced outages due to HRSG tube leaks
- Reduces forced outages and associated costs – up to \$110,000 USD due to potential savings in fines, lost time, and replacement power
- Reduces leak detection system installation costs

APPLICATION

Heat Recovery Steam Generator (HRSG) Tube Leak Detection

CUSTOMER

2-on-1 combined cycle utility power plant in the western U.S.

CHALLENGE

Predicting leaks in heat recovery steam generator (HRSG) tubes is challenging for utilities around the world, with a majority of combined cycle plants lacking leak detection instrumentation. Over time, fatigue and stress cracking can occur in welds or the tubes themselves, or poor welds can cause pinhole leaks. Leaks in the tubes themselves (outside of a weld area) are typically caused by corrosion processes, localized overheating, or incorrect metallurgy. Small super heater and re-heater tube leaks are difficult to detect, as no visible indications are present. Leaks in economizers and evaporators are easy to detect, as water will be present.

This utility was experiencing leaks as often as every three months. Since a reliable detection method was not implemented at the time, the only way to tell if a leak occurred was by going into an outage and shutting down the HRSG, or by observing an increase in water usage in the control system. Shutting the unit down allowed the steam to condense and turn to water, making a large leak visible to the human eye. When a leak was large enough, the plant would experience a forced outage, requiring a crew on site after the unit cooled down (regardless of overtime), the cost of replacement power, or the cost of contracted natural gas for the period of the outage. With potential costs adding up, preventing a single forced outage was estimated at a savings of approximately \$110,000 per HRSG, depending on the location.

SOLUTION

This utility was evaluating the installation of an acoustic tube leak detection system, but it was difficult to justify the cost of a traditional



“Wireless technology makes leak detection affordable, eliminates the high costs of wiring, and allows for a potential planned outage instead of a forced outage by detecting leaks early.”



Rosemount™ 708 Wireless Acoustic Transmitter Provides Non-Intrusive, Real-Time Tube Leak Detection

wired system, even when considering the cost of multiple tube leaks per year in the facility. A wireless acoustic leak detection system from Emerson provided a cost-effective alternative.

Using a *WirelessHART*® network, the utility installed 12 acoustic wireless transmitters on each HRSG, plus an Emerson Wireless Gateway, at a fraction of the cost of a wired system. Based on market research, the total cost per HRSG was a third of the traditional system and required no wire installation.

Wireless technology made predictive leak detection affordable for this utility and allowed it to virtually eliminate the high costs and reduced productivity of forced outages. Within the first six months, Emerson's solution was able to detect four leaks between two HRSG units for the utility. Detecting these leaks allows the utility to quickly address the leaks before they become more significant and lead to lost generation and asset damage.

RESOURCES

Wireless Acoustic Monitor

www.emerson.com/en-ca/measurement-instrumentation/wireless-acoustic

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