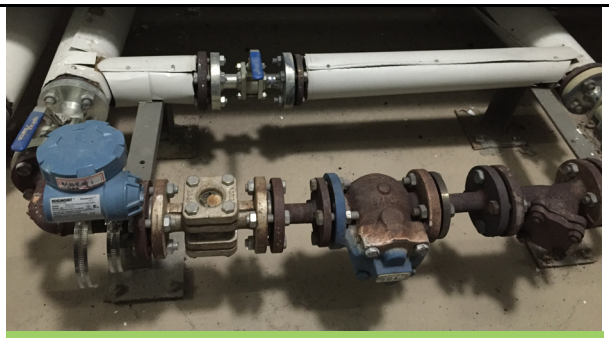
Hangzhou Tobacco Reduces Safety Risks and Improves Energy Efficiency with Emerson's Pervasive Sensing™ Strategy

RESULTS

- Reduced risks caused by water hammer phenomenon
- Reduced energy loss from steam leakage
- Real-time monitoring of steam trap failure
- Reduced frequency of manual monitoring
- Fast instrument installation and start-up



APPLICATION

Steam trap condition monitoring

CUSTOMER

Founded in October 1949, Hangzhou Tobacco is one of China's top 500 industrial enterprises and one of the 36 key industrial enterprises in China's tobacco industry. It is also one of 26 large focused enterprises of Hangzhou municipal government. This is a pilot project executed by the Power and Energy Department where their main responsibilities are energy and production facility management.

CHALLENGE

The noise "bang"..."bang"..."bang"...was heard occasionally from the steam pipeline on site. According to experience, it is caused by the water hammer phenomenon. This happens when condensate water crashes onto the pipe wall when it runs and turns at high speed in the steam pipeline. The water condensate exists in the steam pipeline because the steam trap cannot discharge the condensate effectively as a result of malfunction. This occurs most often when the steam system is reused after shutdown and can also be caused by human errors such as opening the steam trap bypass.

The steam pipe network is about 2km long and steam traps are scattered across the plant. Due to lack of experience, the maintenance personnel is unsure if the steam trap is performing properly even with regular manual inspections. If malfunctioning steam traps are not discovered immediately, it will gradually cause the water hammer phenomenon and energy loss. Hangzhou Tobacco personnel were worried that if the situation continues, the pipeline will break and subsequently lead to process shut down and safety accidents.

When the team planned to implement a real-time steam trap monitoring project, they found that the project implementation task would be very complex due to the geographical constraint. A long and

"Emerson's Smart Wireless system really solves the tricky situation that most steam traps are installed without being properly managed. Its easy installation and high signal reliability nature helped us to acquire useful data for the use of asset safety and energy conservation.

Wu Xiaolei
Assistant Engineer
Power and Energy Department, Hangzhou Tobacco

Hangzhou Tobacco

EMERSON
Process Management

complicated wiring schedule was required for monitoring instrumentation to be installed near the steam trap and send measurement data to the host computer in the central control room. Hence increasing the project complexity, duration, and cost.

Rosemount 708 Wireless Acoustic Transmitter installation

SOLUTION

Emerson™ Process Management proposed a Pervasive Sensing solution to help solve the problem with the solution consisting of:

- (1) Emerson 1420 Smart Wireless Gateway
- (10) Rosemount™ 708 Wireless Acoustic Transmitters

This solution enabled Hangzhou Tobacco to conveniently install the devices for real-time data monitoring. Emerson's Rosemount 708 Wireless Acoustic Transmitters provided real-time diagnostic data so the operators know the three steam trap states: normal, blocked, or leaking. During abnormal circumstances, Hangzhou Tobacco staff can promptly conduct on-site maintenance for the specific steam trap. This can eliminate unnecessary or extra work caused by uncertainty in identifying faulty traps and thus enables the crew to generate the right maintenance plan in a timely manner.

Acoustic transmitters can be installed without breaking and penetrating the pipe like ordinary transmitters. They can be easily fastened onto the pipeline using a pipe clamp 15cm (6 in.) upstream of the steam trap.

As the acoustic transmitter is a wireless device, there is no need to lay cables during installation, saving the connection with all on-site junction boxes, I/O terminals, DCS I/O cards, and other hardware. The device operates on IEC62591 *Wireless*HART® standard communication protocol to communicate wirelessly with the Smart Wireless Gateway. The host computer reads the data from the Smart Wireless Gateway through the standard OPC protocol and feeds back the data to the operator in a real-time manner. The operator can see at a glance the status of all transmitters and plan maintenance activities saving costs since unplanned shutdowns can be avoided.

RESOURCES

Emerson Process Management Food & Beverage Industry

Emerson Smart Wireless Gateways

Rosemount 708 Wireless Acoustic Transmitter

Pervasive Sensing

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