

# Improved Temperature Control & Efficiency

Heating plant efficiency improved with advanced steam temperature controls.



**Improved temperature control with automatic operation of steam loop**



**Increased efficiency and monitoring of steam generation process**



**Added ability to isolate and maintain system with redundant backup**

## APPLICATION

Industrial power co-generation plant optimization

## CUSTOMER

Midwestern university using natural gas-generated steam for heating campus buildings

## CHALLENGE

The heating plant is responsible for keeping the 65,000 people who work and study on campus in more than 300 buildings comfortable. The facility delivers steam at 600 to 175 PSI at temperatures up to 725 degrees F via the desuperheater station. Within it, a Fisher spraywater valve provides water to a Fisher TBX-T cooler section to cool steam down to 430 degrees F.

However, the operators are unable to adequately control the steam temperature. As a result, if steam is too hot, it could potentially damage auxiliary equipment; if too cold, there will not be effective heat transfer. Also, there are serious concerns about the wide differential stressing the system piping. The root cause of the problem: The design process operating conditions that were originally specified are not now in line with the actual plant functioning conditions.

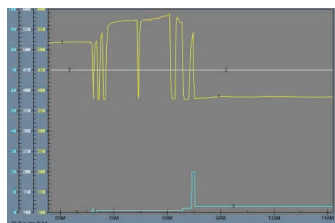
*“The temperature is controlling as it was designed to. We can now use the system to its full potential in automatic and react to loadswings.”*

– Chief Plant Engineer

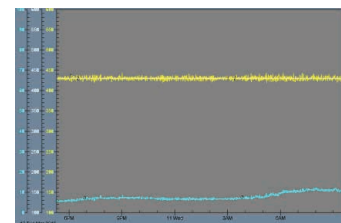
## SOLUTION

Initially, the service team inspected and replaced spraywater nozzles that were plugged and/or stuck open; and replaced undersized strainer to keep debris from plugging nozzles. The team also installed reduced port trim for better control at lower required flows. Then, engineering services determined current process conditions, performed tuning, control

logic and application engineering to confirm sizing of TBX, temperature sensor lengths, and resized the spraywater valve. Their prescription included a reduced trim in the spraywater control valve from 2” to 3/4” port and added Rosemount temperature transmitter to accommodate the longer temperature sensor length requirements at higher steam flows.



**Spray water valve Cv performance with wide temperature swings before changes.**



**After replacement with the recommended 2-inch EZ with Microform Trim.**

## OUTCOME

The operators gained improved temperature control to enable the heating plant to operate the steam loop in automatic mode. In addition, they now enjoy the benefits of a redundant system with the ability to isolate a portion of the plant and perform maintenance when required. Improved heat transfer in the heating systems was also added, as well as decreased fatigue stress on system piping.



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