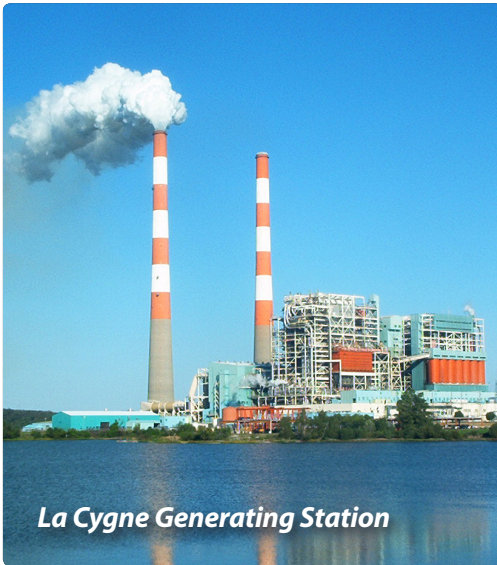


Power Plant Receives Annualized Return on Investment of More Than 200% Every Year Since 2003.

Total Savings to Date Exceeds \$770,000 on Investment of \$50,000.



Accusonic Flowmeter Accurately Detects Plant Trouble Spots, Improves Efficiencies, and Lowers Heat Rate

The Accusonic multiple-path transit-time flowmeter system gives Kansas City Power & Light the ability to accurately foresee and anticipate potential maintenance issues in advance. This foresight is critical to maintaining efficient operations and lowering fuel costs for the plant since the slightest decrease in operational efficiency can significantly drive up fuel costs.

“ Accusonic flowmeter technology has played a key role in helping us develop a reliable system for keeping condensers and circulating water pumps in the best possible operating condition - and keeping plant fuel costs to a minimum. ”

- Rick Heard
Plant Mechanical Engineer

Kansas City Power & Light Company, an investor owned generating utility, reduced plant heat rate by an estimated 0.5% to 1.0% at their La Cygne Generating Station, Unit 1, by installing an Accusonic flowmeter to predict and avoid potential condenser fouling problems before they developed. The preventive measures led to an increase in operational condenser efficiency reducing plant operating fuel costs by lowering the heat rate an estimated 0.5% to 1.0%. In addition, the flowmeter assisted plant personnel in determining the best combination of pump usage for the most efficient operation and addressed potential maintenance issues. Pump runner lift problems were discovered as a result which led to an increase in cooling water flow of 10,000 gpm to the condenser decreasing heat rate an estimated 0.50%.

The Accusonic flowmeter system enabled the plant to:

1. Enhance real-time efficiency calculations of the plant condensers.
2. Monitor for condenser fouling.
3. Dispatch maintenance crews under conditions most favorable for maintaining normal operations.
4. Monitor pump performance indicating necessary adjustments.
5. Determine when pump rebuilds were needed based on specific causes rather than costly dismantling every year based solely on a calendar schedule.

Services Provided by ACCUSONIC:

1. Accusonic's Model 7510 flowmeter was installed in 2003 on the Unit 1 Circulating Water Tunnel. The meter enhances the calculation of real-time efficiency of the plant condensers by continuously monitoring circulating water flowrate. The circulating water is supplied to the condensers via three pumps. The typical flowrate through each unit is 166,000 gpm. Flowrates for each unit are compared for flow analysis.
2. Internal mount transducers were installed in the buried 132" diameter steel reinforced concrete circulating water tunnel.
3. Set-up and commissioning.

Situation

Rick Heard, Plant Mechanical Engineer, at Kansas City Power & Light knew that the plant needed a water flow measurement system that would provide accurate flow data on circulating water to the Unit 1 condenser. The condenser tube-sheets can become plugged by debris and/or fish runs in the source water lake, resulting in reduced overall efficiency of the power plant. Consequently, Rick desired a system with the capacity to detect potential condenser fouling before it developed into a load limitation and point to maintenance issues that could be addressed in winter months prior to increased customer load demand common in the summer. Plugged tubes in the condenser resulting in even a 10% reduction in efficiency could raise overall plant fuel rates considerably. Another costly facet of plant operation was scheduled maintenance on each of the three circulating water pumps, typically every 3 to 4 years, even if there were no problems detected. The pumps, serviced on a routine rotating schedule, were pulled from deep wells, disassembled, and shipped elsewhere for rebuilding. Without a reliable method for detecting specific problems, the costly rebuilding was scheduled on a calendar basis rather than on condition-based criteria, which could have been made available with the Accusonic flowmeter system and predictive maintenance monitoring.

Solution

The level of accuracy necessary for detecting potential condenser fouling excluded any system using a conventional Pitot tube arrangement. When Kansas City Power & Light investigated the Accusonic multiple-path transit-time flow meter, the utility recognized it as a system that would meet their required performance specifications.

1. An Accusonic flow meter was installed in 2003 on Unit 1 Circulating Water Tunnel (132") to detect reduced pump flow and indicated when maintenance was necessary to maintain appropriate flow levels. Special design internal mount transducers allowed installation in the buried tunnel and provided the needed accuracy for the application.
2. In addition, pump flow analysis on each of three 166,000 gpm pumps was conducted to assess overall operational efficiency of the system.

Result

Flow trend analysis clearly identified reductions in cooling water flow levels alerting operators to condenser fouling, debris on the tubesheets, and malfunctioning pumps. This information helped determine specific corrective actions that could be scheduled during periods of low load requirements, resulting in more cost effective maintenance. Condenser efficiency increases were observed potentially lowering the heat rate and the amount of fuel used at the plant. Heat rate decreases estimated from 0.5% to 1.0% were realized when condenser cleaning was implemented. Two flowmeter systems are installed on cooling water tunnels (10 foot diameter and 11 foot diameter pipelines.) Pump flow analysis determined that the lift on one of the three pumps needed adjustment to improve performance. Adjusting the lift, a problem which might otherwise have gone undetected, increased flow rates by as much as 10,000 gallons per minute, ultimately adding to the overall performance of the Unit 1 condenser and decreasing heat rate by an estimated 0.50% Monitoring circulating water pump flow on a daily basis enables Kansas City Power & Light to remove pumps for rebuilding based on specific need rather than on a calendar schedule and to make necessary adjustments between rebuilding. This results in the avoidance of unnecessary and costly pump overhauls.

 is a brand of 

Learn more about ACCUSONIC at www.ACCUSONIC.com

Call: +1 (256) 430-3366

Email: accusonic@idexcorp.com