

Continuous Vibration Monitoring Delivers Fast Returns at Great River Energy



RESULTS

- Saved \$25,000 on installation costs of FOUNDATION™ fieldbus devices
- Saved \$40,000 immediately by identifying an existing motor bearing fault
- Saved \$15,000 by preventing the unplanned shutdown of an atomizer
- Potential saving of up to \$60,000 per year by extending atomizer bearing set replacements from quarterly to semi-annually



APPLICATION

APV Anhydro rotary atomizers turning at 12,000 rpm and driven by 3500 rpm motors are commonly used in power plant scrubbers to reduce airborne pollutants.

CUSTOMER

Great River Energy is Minnesota's second largest electric utility (based on generating capacity) and the fifth largest generation and transmission (G&T) cooperative in the United States. The company provides wholesale electric service to 28 cooperative members in Minnesota and Wisconsin, serving about 1.7 million people. The Elk River Station converts nearly 300,000 tons per year of refuse derived fuel (RDF) into enough electricity to power about 30,000 homes. Energy is conserved, and the amount of waste entering area landfills is reduced by more than 250,000 tons per year.

CHALLENGE

A variety of undesirable materials must be removed from exhaust gases in this waste-to-energy facility. Special environmental equipment treats gases formed in the process of RDF incineration. However, the APV Anhydro atomizers used in the scrubbers require a high degree of maintenance, and they remain in service only two weeks at a time before removal for inspection, cleaning, and repair. Two atomizer units are in service at any given time, while a third receives maintenance. It is then held in reserve until it is time to replace one of the others after just two weeks online.

Elk River Station was changing the expensive precision bearings for these atomizers quarterly as a matter of preventive maintenance. At \$10,000 per bearing set, the plant was spending \$120,000 per year, not including the cost of skilled labor required to make the changes. Still, maintenance personnel had no way of identifying problems that might damage an atomizer and cause a shutdown, which can reduce power generation by 50 percent until emergency repairs are made.

*"We saved \$25,000 on
installation costs alone."*

Glenn Hauck
Elk River Station

SOLUTION

Management at Elk River Station chose the CSI 9210 Machinery Health Transmitter to monitor and protect the three atomizer/drive motor units. By measuring actual machine vibration and calculating bearing vibration values using the PeakVue® capability, plant personnel are able to accurately predict failures well ahead of time. This type of predictive protection turned out to be a very wise decision that saved the company thousands of dollars within weeks after startup.

Immediately after the first CSI 9210 Machinery Health Transmitter was commissioned, it detected a motor bearing fault, and operators were able to shut down the unit safely in time to prevent a costly breakdown. Inspection of the motor showed it was not damaged and only the bearing, which had not been receiving lubricant, needed replacement. The monitoring system provided accurate vibration information, enabling the operators to save the company at least \$40,000 in motor repairs by shutting down when they did.

Within a week, analysis of atomizer vibration detected by a second CSI 9210 transmitter revealed an atomizer bearing problem. In this case, the bearing alarm was at “maintenance level”, so the atomizer was kept in service while operators monitored its condition very closely. Since the backup atomizer was out of service for extended maintenance work, repairing the in-service atomizer could have taken as long as 12 hours, costing approximately \$15,000 in lost production. However, predictive vibration monitoring enabled the operators to monitor the situation, preventing a production loss. An acceptable level of performance was maintained until the next scheduled outage.

Growing confidence in the ability of the CSI 9210 vibration monitoring system is allowing management to extend the replacement schedule for those atomizer bearings. The company will save an additional \$60,000 if the \$10,000 bearing sets on the three atomizers can be replaced twice per year rather than quarterly.



“Early bearing fault detection allows us to predict bearing failures so we can plan ahead for work on the atomizers and avoid lost production.”

Glenn Hauck
Elk River Station

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The CSI 9210 Machinery Health Transmitter powers PlantWeb through predictive diagnostics optimized for motor-pump machine trains to improve availability while reducing operations and maintenance costs.

