Automatic Controller Improves Results and Reduces Operating Costs

Problem
A feed mill in the Midwestern U.S. required a reliable supply of high-quality steam for production. Plant management wanted to reduce operating costs and occasional problems with wet steam were hindering production.

The plant used one 200-HP boiler to produce 100 psig live steam. Typical operation was 12-16 hours per day, five to six days per week, depending on production needs. The primary fuel was natural gas. City water with high alkalinity and hardness levels supplied the boiler makeup water. Dual tank water softeners were used for hardness removal. The boiler tubes were clean.

Analysis
When Chem-Aqua audited the system particular attention was paid to upgrading the chemical feed and blowdown control system. To prevent foaming and carryover, the M-Alkalinity of the boiler water had to be maintained at less than 800 ppm (as CaCO₃) by blowdown. The continuous blowdown rate was controlled using a graduated needle valve installed on the surface blowdown line. Due to the variable operating schedule, it was difficult to maintain the target alkalinity level and blowdown rate with manual control. It was concluded that installing a SteamPak™ automatic proportional blowdown control system would allow the blowdown rate to be reduced from 25% to 17% of the feedwater flow. It was projected this would reduce fuel costs by over $18,000 annually and water usage by over 22,000 gallons per year with payback at 2.6 months, which is a 340% ROI.

Solution
The feed mill purchased and installed the recommended equipment in early 2007. During a subsequent review meeting, actual fuel savings were found to be in excess of $30,000 annually, based on 2007 fuel prices. With fuel costs continuing to rise, the savings have multiplied proportionately. Furthermore, the plant saw a water savings of 52,000 gallons and found the boilers were less susceptible to foaming and carryover and the steam traps less prone to failure.

The Chem-Aqua recommended feed and control system upgrade significantly improved the feed mill’s water treatment program results; reduced fuel, water, and maintenance costs; and enhanced production efficiency.