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Reliability, Energy, and
Maintenance Solutions

Energy Performance Services Helps Paper Mill Reach Potential Energy Savings

Pump efficiency recommendations saved more than \$102,000 per year

Today U.S. industry spends about \$30 billion annually on energy, and \$100 billion on maintenance.¹ Paper mills are big spenders in both categories; according to a Department of Energy study.² Centrifugal pumps are the largest consumer of motor energy in the pulp and paper industry, the study finds, and process pumps have the highest overall potential for electrical energy savings.

Appleton Coated, a large paper manufacturer headquartered in Kimberly, Wisconsin, offers high quality products and services including coated paper for both traditional and digital printing, specialty products, publishing paper, and different text and cover options. The company produces premium quality paper to meet a large range of consumer and corporate needs. It sells over 400,000 tons of its *Utopia* branded paper each year.

At the extensive manufacturing facility in Combined Locks, Wisconsin, over 1,000 centrifugal pumps aid in the production of more than 1,100 tons of paper each day. Ninety-five percent of these pumps are manufactured by ITT Goulds Pumps and were recommended by local consultant and distributor Crane Engineering.

CUSTOMER PROBLEM:

Little Time to Assess Energy Efficiency

The mill operates 24 hours day, seven days a week, with brief shutdowns twice a year for major maintenance reviews. With a booming business and a talented engineering staff focused on maintaining production, the company has limited time to research potential energy saving projects.

All of the paper machines are new or have been upgraded within the past 15 years, but many of the pumps used in processing wood pulp into coated paper stock are older. As energy prices have risen rapidly in recent years, and utilities provide price incentives to reduce demand, improving the energy efficiency of pump systems has become a priority.

ITT SOLUTION:

Energy Savings No Longer a *Utopian* Dream

A consultant from Crane Engineering connected Appleton Coated with Mike Pemberton, Energy Performance Services Manager at ITT Industrial Process (Goulds Pumps), to help evaluate pump system energy usage in the mill.

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CASE STUDY

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The ITT Energy Performance Services team works directly with plant engineers, operators and maintenance to perform an in-depth assessment of key pump systems. The primary goal of the assessment is to recommend mechanical and control changes that allow pumps to operate near the best efficiency point (BEP). The team spends about three days on site, with a detailed assessment following two to three weeks later. Recommendations to improve efficiency can include: implementing impeller diameter change; adding variable frequency drives; and rerating, repairing or replacing pumps. The Appleton Coated report assessed the operation by each paper machine's process, with a focus on pump systems that are major energy users as well as the "bad actors" that require frequent maintenance.

"The engineers at Appleton Coated do a great job of running and maintaining the entire process and sustaining production. It's my job to help them review the process with a focus on pump system efficiency that will yield cost savings to the operation as a whole," said Pemberton.

Bob Jochman, Associate Project Engineer in the Appleton Coated plant engineering department, said that the report was a useful tool. "There isn't enough time or manpower available to do such a detailed evaluation on these pumps. Our priorities are in maintenance and process management. ITT Goulds made recommendations focused on pumping efficiency, which helps us to lower energy costs as well as maintenance."

Jochman implemented efficiency improvements on a broke chest pump and several filtered water pumps. Other engineers at Appleton Coated have installed variable frequency drives based on Pemberton's recommendations, improving the efficiency of five pumps so far.

THE BOTTOM LINE:

Pemberton's pump assessment for Appleton Coated recommended potential efficiency improvement for 23 pumps. To date, the mill has implemented variable frequency drive on five applications that have a 2.5 year payback, amounting to \$102,000 savings per year. Other pump optimization projects are scheduled for the future. The mill was also able to take advantage of utility incentive programs for additional savings.

Two examples of implemented changes include:

- A 40HP "broke chest" pump, which pulls unused pulp from the end of the paper machine for reprocessing into product. Jochman installed a variable speed drive on this relatively small pump that yielded big savings.
 - Reduced the average running speed by 35 percent, generating energy savings of \$16,000 per year
- A 100HP "filtered water" pump
 - Reduced the average running speed by 35 percent, generating energy savings of \$16,000 per year



¹ Industrial Information Resources data, 2008

² U.S. Department of Energy – Office of Industrial Technology U.S. Industrial Motor Systems Market Opportunity Assessment, 1998