



Augusta Newsprint: “Showcase” puts spotlight on energy projects

A Department of Energy-sponsored showcase—to be held at Augusta Newsprint in Augusta, Georgia on March 6 and 7—demonstrates how energy saving technologies can work in a mill environment.

The eyes of the paper industry will be on Augusta Newsprint when the mill hosts a Department of Energy (DOE) Showcase on March 6 and 7. The event will demonstrate several innovative, energy-saving technologies. Sponsored by the DOE's Office of Industrial Technology (OIT), the Showcase's goal is to encourage other mills to explore and implement energy-saving technologies.

For example, one of the new technologies being demonstrated is a system from ITT Industries' Goulds Pumps/PumpSmart Control Solutions business unit. This variable speed control system, with embedded intelligence, has allowed the mill to remove a cavitating control valve, reduce energy use, and increase the MTBF of a 200-horsepower centrifugal pump.

ASSESSING ENERGY USE

Augusta Newsprint was founded in 1965 as Cox Newsprint. At the time, the mill included one paper machine and a groundwood pulp mill. Today, the mill operates two paper machines, a woodyard, a thermomechanical pulp (TMP) mill, a recycled newsprint mill, a bark boiler, utilities, and support areas. Augusta Newsprint employs 390 people and produces 1200 tons per day of newsprint. The mill's furnish is 65% southern pine and 35% recovered paper, including old newspapers and magazines.

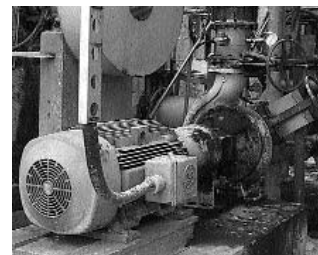
In May 2000, Augusta Newsprint began consulting with OIT, which then helped the mill assess energy use and identify energy-saving opportunities. This led to the mill becoming an industry showcase site. OIT Showcases are public events that highlight the latest energy-management practices and energy-efficient technologies emerging from OIT-sponsored research and development. The focus is on “real world” technology that has been implemented at industrial facilities.

The Showcase process usually begins with a plant-wide assessment performed with the assistance of OIT's Best Practices program or university-based Industrial Assessment Cen-

ters. Plants then implement assessment recommendations in the form of process or system improvements. Next, an independent third party validates the technology performance and costs.

“Showcases provide the opportunity for participants to learn from and exchange ideas with researchers, colleagues, and OIT staff about industry programs and projects—particularly those that are ready for plant floor application,” explains Denise Swink, OIT's deputy assistant secretary.

“Augusta Newsprint is open to new ways of doing things, taking some calculated risks, and



Left: Flow tube replaces inefficient control valve. Above: PumpSmart intelligent flow control system will save \$30,000/yr.

trying new technologies,” said Chuck Amos, the plant's engineering manager. “We saw it as a chance to learn and grow and to focus on energy costs and savings.”

PUMPING SYSTEM BOOSTS EFFICIENCY

Augusta Newsprint ranked high in overall energy efficiency, according to the OIT assessment. However, the assessment revealed several opportunities to reduce electrical consumption across the mill's mechanical systems—including the pumping system.

DOE's United States Industrial Electrical Motor Systems Market Opportunities Assessment report, published in 1998, revealed centrifugal pumps, as a group, were the single largest energy consumers in pulp and paper mills. At Augusta Newsprint, pumps consume 21% of the mill's energy.

After OIT's initial assessment, Augusta targeted process pumps, in general, and its thermo-

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mechanical pulp mill (TMP), in particular, for more in-depth study. The mill began working with project partners Dean Oliver International (DOI), an Atlanta-based consulting firm, and ITT Industries' Goulds Pumps unit, a major supplier of process pumps and a Best Practices Allied Partner. The team analyzed and reviewed more than 150 mill pumping systems. This review included motor and pump systems, the refiner mechanical pulp mill, and the TMP plant. The review also revealed areas for improvement in the TMP plant's process equipment and control strategies.

PUMP POWER

One of the upgrades was a Goulds PumpSmart® control system, which has improved control of the low-density stock level in one of the mill's TMP storage towers. Before the PumpSmart installation, the mill relied on a valve to control flow from the tower's 200-hp fixed-speed pump. This application consumed significantly more energy because of the high system head associated with the throttling control valve. Furthermore, throttling as a means of controlling flow caused severe cavitation across the flow control valve.

Cavitation often leads to valve and piping damage, resulting in frequent valve failures. The solution was the installation (on a non-Goulds pump) of a PumpSmart variable frequency drive (VFD) that incorporates intelligent flow control. As a result, motor speed has been reduced from 1150 rpm to around 450 rpm, while eliminating the control valve and its associated repairs. Augusta Newsprint could achieve a total savings of about \$720,000 over the 20-year life cycle of the pump, based on maintenance and operating costs as well as other factors. The company estimates energy cost savings of over \$ 30,000 annually from installation of this new technology on just one pump.

REDUCING LIFE CYCLE COSTS

Goulds' PumpSmart system uses any standard centrifugal process pump in conjunction with ITT Industries' patented PumpSmart control system and software. Intelligent flow control protects the pump from catastrophic damage caused by cavitation, closed valves, and low flow conditions while reducing life cycle costs. By eliminating the wiring and piping of valves and recirculation lines, PumpSmart reduces installation costs. Likewise, the system reduces operating costs since the pump operation matches the system requirements without control valves. The variable speed control operates the pump at the best efficiency point (BEP) and at a slower rpm. Energy consuming control valves and recirculation lines are eliminated. The energy savings are calculated and displayed at the DCS or on the PumpSmart keypad. PumpSmart also reduces maintenance costs and increases MTBF.

GOING FOR THE GOAL

Augusta Newsprint has set a goal of reducing energy use by 1% each year for the next 5 years. Thanks in part to the energy savings supplied by one PumpSmart-equipped centrifugal pump, the mill will be able to achieve this goal for 2002.

As the forest products industry faces increasing economic challenges, improvements like these-implemented at many different mills-will be vital. The DOE's Office of Industrial Technology, working in concert with the forest products industry, is facilitating and collaborating on research and development efforts, cost-sharing technology implementation, and other vital programs. Through this partnership, mills can identify opportunities through plantwide energy-use assessments and then implement vital new technology that can have a dramatic impact on mill energy usage. **SI**

Zeroing in on energy savings

ings in the U.S. pulp and paper industry are concentrated in pump system improvements-particularly those that involve mid- to large-size pumps. Efficiency measures such as replacing throttling valves with speed controls can yield savings that range from 5% to 50% of the system's total energy use.

The Finnish Technical Research Center (for Manufacturing Technol-

ogy) Report, Expert Systems for Diagnosis of the Condition and Performance of Centrifugal Pumps, concurs that there is plenty of room for improvement in pump system efficiency. A review of 1760 pumps at more than 20 industrial sites showed that average pumping system efficiency was below 40%, with 10% of the pumps operating below 10% efficiency. Furthermore, these studies estimate that 70% of pumping systems are oversized and operating with throttled valves that are frequently less than 50% open. Throttled valves result in significantly higher energy consumption

and reduced system reliability. In the past, using oversized pumps has been the standard practice to ensure throughput during peak production periods or to accommodate capacity growth. However, smart VFD technologies such as PumpSmart offer many advantages to traditional valve-controlled fixed speed systems. Reliability and unit costs of VFD systems have improved dramatically, and as energy costs continue to increase, VFD technology is gaining wider acceptance as a fundamentally better way to run continuous and, in some cases, batch processes.