New distributed and quality control systems for Sonoco’s Hartville corrugated medium machine (PM 10) has led to new and improved

DOORS OPEN FOR SONOCO

Built as a pulp plant in 1899, Sonoco’s Hartville, SC, mill is still going strong more than 110 years later. Of course, it has expanded greatly since then and now runs seven uncoated recycled paper board/medium machines. It has just wrapped up an automation project on its largest machine, PM 10 a semi-chemical corrugated medium machine. Installed in 1958, the unit can now produce about 178,000 tons/yr, mostly lightweight (23 lb) medium.

The work was done, according to Mark Hayter, production superintendent, because the machine had an older system that led to control “issues”. “It was difficult to work on,” he adds. “We asked for a quality control system and distributed control system (QCS/DCS) with a new scanner system and a 100% profiling steambox.”

Previously, the mill could not separate the gauging system from the old DCS. If one went down, all went down. Also, the mill was having quality issues related to basis weight and moisture.

In August 2008, Sonoco decided that ABB met its needs: a Unified 800xA QCS and DCS. ABB also replaced the existing steambox with the SteamPlus Profiler, an SP1200 scanner and Autoslice Aquatrol. The systems were installed during a four-day period in January 2009. Total cost of the project was approximately $2 million. As well as the automation equipment, the mill also upgraded its winder drives and controls, and added a new suction pick-up roll from Voith.

The improved moisture control has meant the mill does not need to add water in the dryer section while still meeting CD moisture variation targets. The mill had a rewet shower, but with the new steambox it is no longer needed. The mill has improved its CD moisture variation by 60 percent. There are similar improvements in MD variation.

Although the work was done mainly to improve quality as well as to improve control of the machine, there were also energy savings. For example, with the old steambox, PM 10 used 10-12,000 lb/hr of steam. Now, it uses 4-5,000 lb/hr.

The new equipment has done its job. “We get much tighter and faster moisture control,” says Rob Shaw, paper process engineer, paper. “We are also achieving more consistent quality.”

The new automated controls have also allowed PM 10 to produce heavier medium grades: 30-33, 36 and 48 lb. Historically, all the medium from PM 10 was destined for Georgia-Pacific’s box plants.
Although G-P is still one of Sonoco’s largest customers, the prior contract to produce exclusively for G-P is planning out over 2010.

The change also allows PM 10 to move into heavier weight medium which means that grade changes will have to be done more frequently and the new equipment gives Sonoco a boost.

WHAT’S NEXT?

Right now, Sonoco is working to establishing itself in the market as an independent medium producer to new customers.

Being a commodity item, price is usually the first thing a customer will ask about. Still, under company policy, the mill aims for a 4% year-over-year productivity improvement. This is very important to Sonoco and the effort put into the program has paid off. Production costs per tonne have fallen. The company has always reached out to employees for their input. All four machine crews from PM 10 were very involved with the process and 213 suggestions were forthcoming in an effort to reduce costs. A lot of smaller projects were done and Hayter notes that more than 50% percent of the goal was reached without having to spend capital.

As well as price, the move into high-performance medium has put an added emphasis on strength specs such as ring crush. The product must meet similar property parameters at a lower basis weight. Finally, most customers also look at moisture profiles so CD variability is a third quality they study most diligently.

BACK TO SCHOOL

The new automation system was quite a change for operators. Some of the electrical and instrumentation staff went to the ABB “university” in Columbus, OH. Machine crews did training on site on a built-in simulator that can also be used for refresher training in the future. This was a very effective tool, according to Shaw. ABB staff was also on site for a month after startup.

The training was so comprehensive that machine crews were able to give input on the way they thought the system would be able to work more effectively. As the QCS and DCS started up simultaneously, it was quite involved for the operators but they came through very successfully.

The mill is traditionally a “self-maintainer”, says Hayter. Now, it has all the process inputs and data from the QCS and DCS. These can be fed into its plant information system. This data is valuable for process, equipment and cost reduction projects. It also gives operators the opportunity to troubleshoot.

It stores all historical data, which can be down-

The rest of the mill

Besides PM 10, Hartsville also has six cylinder machines producing uncoated recycled board for tube and core applications. PMs 1, 3 and 9 are in one Mill 1, while PMs 4, 6 and 7 are in Mill 2.

Sonoco has its own recycling division that supplies the mill’s raw material, mostly OCC, from numerous cities in the southeast including Columbia, SC, Raleigh, NC and Savannah, GA.

While the six cylinder machines uses only secondary fiber, PM 10 also uses semi-chemical pulp produced on site. The usual mix for PM 10 is 70% recycled; 30% virgin pulp. PM 10 has its own dedicated OCC line.

Sonoco has its own woodlands so the mill is totally integrated. The mill also buys some residual chips from area sawmills.
loaded onto Excel sheets to show trends. The ability to trend is a good feature for all crews, and gives the type of detail that operators did not have in the past.

The systems are easy to use and there is extremely fast information retrieval on the screens. Besides the main control room, there is a monitor at the dry end for the backtender as well as one in the quality control room. Parameters can be adjusted while testing samples if needed.

PM 10 has continuous online vibration monitoring on the wet end. Shaw says this is an extremely valuable tool that has paid for itself many times over. Crews almost always catch bearing failures before they happen.

As noted, the workforce is very involved with operations. Hayter says the mill has a “fairly self-directed” workforce. There are no shift supervisors and a very lean salaried staff.

Safety is paramount to Sonoco, with reinforcement messages displayed prominently throughout the mill. PPI