

BEATING THE CLOCK

THEY HAD LESS THAN FIVE DAYS TO REMOVE, REFINISH, REINSTALL AND RESTART A HEADBOX – WHILE ANOTHER TEAM WAS SIMULTANEOUSLY WORKING ON THE UNIT.

BUT WITH METICULOUS PLANNING AND PRECISE COORDINATION, BOWATER THUNDER BAY AND GL&V MET THE CHALLENGE – AND BEAT THE CLOCK.



With two pulp mills, three paper machines and nearly 1,400 employees, Bowater's Thunder Bay complex is the largest paper mill in Canada, and the third largest in all of North America. Altogether, Bowater Thunder Bay produces well over 500,000 ADMt of newsprint per year. And with Bowater's stated goal to be the preferred newsprint supplier in the North American marketplace, the mill is under pressure to ensure that every roll meets demanding standards for opacity, strength, consistency and tear resistance.

But since affordability is as important as printability to newsprint buyers – and downtime can easily cost up to \$20,000 an hour -- Thunder Bay is under equal pressure to keep machines running. "Downtime is precious to us," says Bowater's Warren Cottrell. "We need to produce over 1,400 metric tons of newsprint per day, so we can't afford to have a machine stay idle one minute longer than is absolutely necessary."

The difficulties of maintaining high quality and low downtime were bought into sharp focus when it became obvious in early 2001 that the headbox on Thunder Bay's Machine Number 4 required serious attention. When Réjean Théroux of GL&V, Trois Riviere, Quebec-based supplier of papermaking technologies and services, surveyed the Beloit-built headbox in March 2001, he found several problems. Misaligned cheeking pieces were causing rooster tails, while nicks on the outside edge of the apron and the slice lip were creating sheet streaks. Théroux was able to minimize these problems on his service visit. The most serious problem, however, would require a major effort to correct.



For years, the polished stainless steel surfaces on the headbox slice body and apron had been exposed to the abrasive and corrosive fillers needed to create a high quality sheet. As a result, these once-pristine surfaces had become covered with scores of scratches and pits. Fibers and other organic matter lodged in these surface flaws, forming into "stringers". When these stringers eventually broke off, they fell into the stock and onto the sheet and four-drainer wire. The result was roll after roll of blemished, lower quality sheet. According to Dean McDonald, Paper Machine Superintendent for Machine No. 4,

There is only one certain solution to stringers: a process known as headbox polishing, where the surfaces are meticulously ground and sanded to precisely remove the pitted layer of stainless steel, leaving a clean, smooth and unblemished surface behind. According to GL&V's Stéphane St-Cyr, headbox polishing is a job that requires exacting skill and patience. "You can't rush it. You have to proceed gradually to make certain you remove all the pits and scratches – without leaving new scratches behind." All in all, over 225 square feet of surface would have to be polished, with every inch finished to a mirror-like 4 RMS to meet specs.

To get to the scarred surfaces, the headbox would have to be removed from Machine No. 4, placed in a specially fabricated cradle and partially dismantled. Obviously, this series of operations could only be accomplished during a complete machine shutdown. And the polishing process itself would take days to



complete, not including the time needed to reassemble and reinstall of the headbox.

In the case of Machine No. 4, however, there were additional factors that further complicated the situation. First of all, the only time the headbox polishing could be accomplished was during a five-day shutdown, scheduled for May 2001. To make matters even more difficult, a complete control upgrade for the 30 ft.-long headbox was also scheduled for the same five-day shutdown. So while one team was polishing the headbox surfaces, another team would also be working on the headbox, installing (among other things) a total of 64 new slice actuators. Bowater's Cottrell, who was Maintenance Supervisor of Machine 4 at the time, remembers thinking; "this is going to be a once-in-a-lifetime project."

Finding the right partner – and making the right preparations.

With so much at stake – and so little margin for errors or misunderstandings – choosing the right supplier to perform the headbox polishing was essential. And it was a project few suppliers in North America, or the world, were

equipped to fully handle. "There's definitely a mystique that surrounds headboxes," says St-Cyr. "It takes a lot of specialized knowledge and experience to successfully work on one. In some mills it's almost seen as black magic."

Above and beyond unique capabilities, the supplier would have to be a known quantity, someone that had a successful track working with the mill, so that the project could proceed as smoothly (and as quickly) as possible. In addition, the supplier would have to be skilled at coordinating and planning, to prevent conflicts and problems from overwhelming an already complex project.

Cottrell and the team at Thunder Bay chose GL&V for the project, primarily on the basis of past performance. "Without exception, our prior experience with GL&V has been positive," Cottrell says of the "Every project we've worked together on has been a success." In addition, GL&V could draw on some of the most experienced headbox experts for the project. Réjean Théroix, the crew leader who had diagnosed the headbox's problems on an earlier service visit, had spent decades working with headboxes. During his years with Beloit, Théroix built, installed, and serviced headboxes throughout North America. For the

Thunder bay project, he would be leading a team of twelve service specialists, many of whom also had years of experience working on Beloit headboxes that were similar to the one on Machine #4.

Still, GL&V's Jim Bagley knew that everyone involved in the project would have their work cut out for them. "It's much riskier and more difficult to work with an existing installation than on a new project," he points out. "It's like the difference between building a new house and renovating an old one. There are always hidden problems, undocumented changes created over the years, and unexpected situations that crop up." Stéphane St-Cyr, who would manage the project, agrees. "No matter how much you know, no matter how many other headbox projects you've done, you never quite know what you're going to find when you open up a headbox."

To anticipate and accommodate as many of these situations as possible, Bowater and GL&V performed extensive preplanning. Work procedures had to be developed that would allow the GL&V team to perform the precision polishing – while not interfering with the team from Measurex, who would be installing over sixty slice actuators at the same time. Weeks before the May shutdown, the GL&V and Bowater teams were already at work, designing and building the cradle that would hold the headbox once it was removed and disassembled. As the May shutdown drew nearer, GL&V chartered a plane for their service team, to ensure the entire crew would be on site and ready the moment they were needed.

An exceptional effort – and a great finish.

The project began on the evening of May 13th, with the removal and dismantling of the headbox, a step that required great care. As St-Cyr points out, just a small mistake in rigging or lifting the headbox (especially one as large and heavy as the

unit on Machine No. 4), could cause strains and misalignment that might significantly damage it.

By 8 AM on the 14th, the headbox was in position in its cradle and disassembled. Now, the project could begin in earnest. Working around the clock in twelve-hour shifts, each team of six workers carefully polished the stainless steel surfaces. It was a labor- and time-consuming process, as the polishers gradually moved from medium to fine abrasives in order to produce a fine, scratch-free finish. While the team installing the slice actuator upgrades, worked on one side of the headbox, the GL&V team worked on the other. "Fortunately, it was a big enough headbox for the both of us," jokes St-Cyr.

For three straight days and six consecutive twelve-hour shifts, the work went on inside the headbox. In addition to polishing out the stainless steel surfaces, the GL&V teams also made other repairs to the surfaces, filling in cracks and repairing the outside edge of the apron lip. The last step in the polishing process was passivating, where the freshly polished stainless steel surfaces were treated with a solution of nitric and sulfuric acid to create a

thin layer of oxidation. This oxidized layer acted as a barrier, to prevent the much more damaging oxidation that would occur if water and stock contacted the polished, untreated stainless steel.

Despite the complications and obstacles – and a polishing process that couldn't be hurried – the GL&V teams made fast progress. Hours before the 4 AM deadline on May 16th, they were wrapping up the final details on the project. By March 17th, GL&V's Thérout was supervising the delicate task of reassembling and reinstalling the headbox. A few hours later, the start-up process began on Machine No. 4. And the difference in headbox performance was almost immediately apparent. For all the parties involved, the project was a resounding success against difficult odds. Bowater's Cottrell chalks it up to smart planning, an attention to detail, and the choice of the right supplier: "In over fifteen years in the paper industry, I've never seen anyone else who could put together a job like this. In terms of capabilities, cooperation, and timeliness, GL&V's performance was simply exceptional."

