KEEPING AGING **ASSETS VIABLE**

Nippon Paper Industries, Port Angeles, WA, produces 400 tonnes/day of directory paper on two paper machines

By GRAEME RODDEN, Executive Editor

The project to upgrade Nippon Paper's PM 2 was so successful that ROI is estimated at five years instead of the forecast 9.2 years

After years of faithful service, it was finally time for Nippon Paper Industries' PM 2 at the Port Angeles, WA, mill to receive a makeover.

With capital tight, the company had to look at where it could receive the biggest bang for its buck. But it was obvious that the press section badly needed to be upgraded. At well over 80 years old, PM 2 had already had its press section rebuilt three times. Originally built by Rice Barton in 1926, a Voith headbox was installed in 1981 while Black Clawson supplied a new top wire former in 1987.

The poor condition of its framing, particularly between the first and second presses, necessitated the project. The mill also saw it as an opportunity to close the long open draw between the press and dryer sections. PM 2 has a reel trim width of 157 in. and ran at 3,150 ft/min. It typically runs on a furnish of 55% mechanical pulp, 40% DIP and 5% kraft.

The mill runs two paper machines, producing approximately 400 tonnes/day of directory grades. Both machines are aging and Nippon looked at both of them with an eye towards the limiting factors to performance and the opportunities that were available that would help the mill achieve a "substantial increase in productivity".

In late 2004, Nippon hired AMEC to do an audit of the two machines. The mill's engineering manager, Dean Reed, compliments the consultants' excellent work on the audit.

In terms of productivity, PM 3 offered more potential. However, due to the poor condition of the PM 2 press section, it was decided that it provided the better opportunity for improvement.

Nippon was able to proceed with eight of the 12 areas identified for improvement in the audit. The $8.1-million

project was approved in May 2006. Work began on May 7, 2007, and was completed 16 days later.

The objectives were to increase machine efficiency from 88% to 90% on the heavier grades (#22.2+) that PM 2 makes and from 84.5 to 86.5% on #18 grades.

The mill also aimed at increasing PM's speed by 60 ft/min while maintaining the full usable trim. Other aims included improving dryer uniformity while maintaining other quality parameters, reducing dryer steam use by increasing the loading at the second and third nips, reducing doctor blade and maintenance costs. And, finally, Nippon wanted to reduce and optimize the open draws and sheet transfers.

The increased loading on the second and third press copied earlier work done on PM 3, a project with which the mill had good success.

Although work was primarily restricted to the press section, there were improvements in the forming and drying sections as well. Some areas were not doctoring properly in the former so this was corrected. There were problems with the felt handling equipment in some dryer sections and this was also fixed.

Nippon chose Kadant to supply the doctors and doctor lubrication showers in the forming section while Metso guides and stretchers were purchased for the third (top) and fourth (top and bottom) dryer sections. Metso supplied double doctors for the second and third presses, which is something new for the mill.

"We run a straight through press section," Reed explains, "and there was great financial motivation to re-use as much equipment as possible."

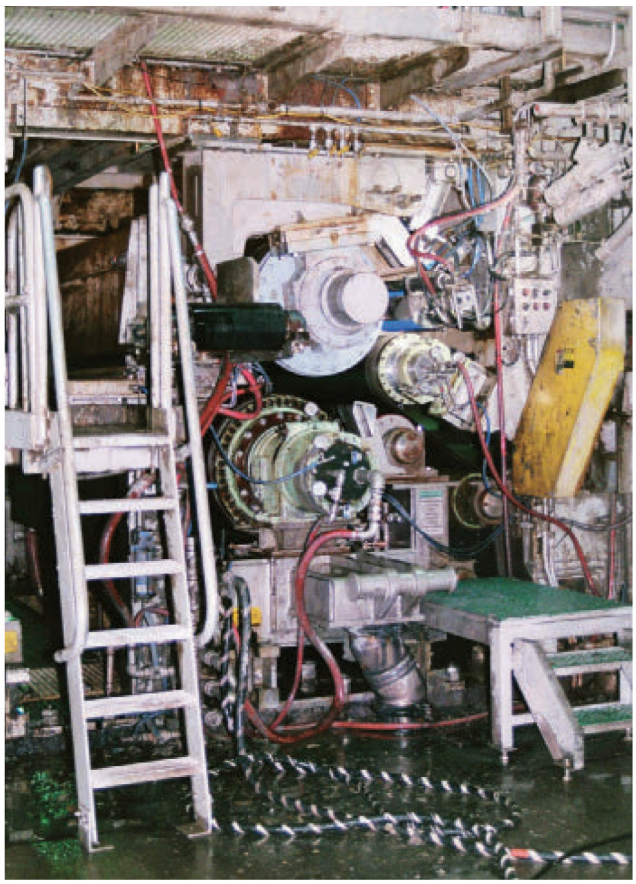
One such example can be found with the re-use of the top beam on the press section. "This put a constraint on how much we could open up the press section," Reed adds.

The press section has three single nip presses with a double felted first press. The bottom felt carries the web into the second press. Previously, the felts were pneumatically loaded with an air over water arrangement to dampen vibration. The sheet is transferred

The "construction gang" assembled for a pre-startup photo

to the dryer section over a driven paper roll with support from a PressRun blowbox.

Following the audit and approval for the go-ahead, Nippon chose Metso Paper to carry out the work with JH Kelly (Longview,



The mill added hydraulic loading to the second and third press sections

Leading the way

Since 2002, the mill has taken huge steps in its environmental stewardship program. Now, more than 81% of its steam demand is met by biomass burning. Oil use has fallen 86%. Steam consumption per tonne of paper has dropped 26%. Refiner mechanical pulp (RMP) electrical consumption per tonne of paper has dropped 17%.

Since the installation of a heat recovery unit, particulate emissions have been reduced by 45%.

Recent (2008) projects include the installation of oxygen injection equipment to reduce hydrogen sulfides (odors) by 88% at the primary clarifier; sludge press moisture optimization; and, deaerator heat recovery (1.8 Mbtu/hr heat savings from recaptured steam).

Advanced Dynamics supplied a new roll handling system in 2008 that handles both paper machines

Group Vision 2015

Tracing its roots back to 1871, when it began operations as the Shoshi Company, today Nippon Paper Industries' plan for the future is called Group Vision 2015. It declares that the company expects to become one of the top five pulp and paper companies in the world. Its recent acquisition of Paper Australia (a PaperlinX subsidiary) is one manifestation of that vision to grow as a company, both in profitability and world scale.

One of its aims is to expand its core business in three key markets: Asia, North America and Europe, with the goal of increasing its overseas sales ratio to 30%. NPI plans to continually deploy cutting-edge market strategies "armed with the world's best product lineup and new product development capabilities backed by proprietary development and technology."

It sees possessing key mills that will "hold strong in the face of international price competition. And these mills will possess individual strengths that will be "deeply rooted" in their customer bases and local areas.

WA) acting as the general contractor. Reed notes that Metso has been the primary supplier of paper machine equipment to the mill for more than 10 years. "Metso was very understanding of our needs and limitations."

Kelly did the work on a time and material (not fixed price) basis and "They performed very well," Reed says. "They did the pre-project work and then the execution. We were very pleased."

"A NICE ADVANCE"

In the first press, a new roll out beam and trolley assembly was installed for the bottom roll. A new save-all pan was added as were front and backside support posts and a bottom roll doctor. Nippon decided to continue to air load the first press nip (financial considerations), although Reed says that will likely change in the future.

The mill reconfigured the first to second press bottom felt run with increased felt length and a new felt guide.

The roll out assemblies, installed under the second and third press assemblies as well, are a "nice advance", Reed says, for selected roll changes.

In the second and third presses, the mill opted for hydraulic loading arms. It also rebuilt the section with stainless steel framework and added a new save-all pan.

The second press now has a ceramic covered top roll, new double doctor with lubrication showers, a new broke conveyor with cross walk and some needed brackets and sole plates.

In addition to the hydraulic loading and roll out assembly, the third press also received a new save-all pan. The mill was able to reduce the draw between the second and third presses.

THE NUMBERS TELL THE STORY

Since startup, Reed says that the new look PM 2 has "performed exceedingly well. We achieved all our objectives and are looking at a return of investment of five years instead of the forecast 9.2 years. The machine just started up and ran. The equipment was installed properly and our people were prepared to run it."

The planned speed increased was 60 ft/min but the machine has shown that there was more potential. The average increase for the 12 months after the rebuild has been 137 ft/min. This is equivalent to 2,720 extra tonnes/yr, 1,530 tonnes more than expected.

The press loadings on the second and third presses have gone from 400 pli and 600 pli to 550 pli and 700 pli respectively. Press moisture samples show that the planned increase of 2% was achieved. Drying

steam per tonne is at the lowest level in several years. The improved moisture profiles have allowed the mill to set higher reel moisture set points.

The new press doctoring helped reduce sharply the number of sheet breaks caused by doctoring. Doctor blades are running 14 days or more, which is better than planned. And, the blades can be change without locking out the machine, helping efficiency.

Reed says that some retraining was needed, primarily around the hydraulic loading system and its lockout procedures.

Staff had to learn to operate the new tail threading equipment from the second to third press and the third press to the dryer. "But still," Reed adds, "it is a straight through press section and our crews are very good at this."

Nothing on the control end needed changing and the drives were untouched. The operator interface is different but from a functions perspective, there was no real change.

Reed pays particular credit to two people who helped lead the project: Ralph Renes, senior project engineer who was project manager and has since retired. And, Brain Card, PM 2 operations superintendent, who has since moved on to the Georgia-Pacific mill in Camas, WA.

"It's the people who make it and we were fortunate to have a great team," Reed adds. "We met or exceeded all our project goals from startup."

In these times, an aging mill and machines need constant upkeep to remain competitive with more modern mega-mills. At Port Angeles, Reed says that PM 2's approach system is about at its limits while PM 3 needs some work on its dryer.

Away from the paper machines, Nippon Paper is working hard at reducing fixed costs and improving its thermal efficiency (to reduce steam demand).

The mill also wants to reduce its reliance on oil. There is no natural gas delivery in the region but the mill is still able to go off oil eight months of the year.

Reed says that the mill has done a lot with automation, allowing it to reduce staffing. For example, the mill was able to install an automated wrap line from Advanced Dynamics to handle both machines. It was installed in 2008 without the need for downtime.

"We are looking at energy and manpower, more than productivity,' Reed says. But, he stresses, "Manpower reductions will come through attrition, not layoffs." **PPI**

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