



▲ Greg Hallas, ANDRITZ Product Manager for Twin Roll Press Services (left), with Kelly Parfitt, Canfor Project Engineer, standing on post-oxygen press #1 that received the Multi-E-Nip upgrade.

A pressing problem ... SOLVED.

The team at Canfor had a problem with a twin roll press. What do you do when there is no ready-made solution? You innovate. Or, better yet, find a technology and service supplier who has the skills to be your innovation partner.

When Greg Hallas walks into Kelly Parfitt's office, there is the usual friendly banter, inquiries about family, and the standard question, "How's POW #1 running?" You would think they have been long-time colleagues.

Colleagues they are, even though they are on different sides of the supplier-customer relationship. But, they have not known each other all that long – just the length of one upgrade project. Hallas is Product Manager for Twin Roll Press Services for ANDRITZ in North America. Parfitt is a Project Engineer

for two adjacent Canfor mills in Prince George, British Columbia, Canada.

"Suppliers throw around the word 'partnership' all the time," Parfitt says. "For me, a true partnership requires both parties to have something at risk and something to gain. Both have to be committed to staying – even when things get tough. The upgrade of our post-oxygen wash press (POW #1) here was a true partnership."

The risk for Canfor was that the upgrade that Hallas recommended had never been

tried before. The potential reward was greatly increased washing efficiency, reduced COD to the bleach plant, and a very stable operation. All at a fraction of the cost of a new press.

Loaded (with COD)

Canfor's digester is heavily loaded, running continuously at nearly twice its original 600 t/d rated capacity. Because of this, very little washing is done in the digester itself. That is why the fiberline includes a pressure diffuser, two brownstock washers, a pre-oxygen washer, and two wash presses. "Even with

this, we run a high COD load into our bleach plant," Parfitt says.

High COD carryover requires significant chlorine dioxide just to neutralize it before the bleaching can take place. "We looked at different options across the fiberline to reduce bleaching costs," Parfitt explains. "We also knew we could reduce our effluent load. So, there are many benefits to running cleaner pulp into the bleach plant."

Investing in what we have

A company of Canfor's size certainly has the money to replace a press or two. "We don't just throw out equipment to buy something new," Parfitt says. "We push our equipment reasonably hard and we are always looking for ways to make our existing equipment operate better and at a lower cost. That is our job."

Canfor's focus honed in on the wash presses since they were the last stage before bleaching. "Improving the wash presses should also help our oxygen delignification process, since we have been holding back on caustic to reduce soda carryover to the bleach plant."

With the goal of improving the existing presses, Parfitt and a colleague started speaking to vendors. "Their options were limited," Parfitt says, "either in the benefit or very high in capital cost. For example, one option was to go to a medium-consistency screw feed with a medium-consistency downpipe and pump. That is a huge capital cost."

Faced with the currently available options – and not being happy with any of them – Canfor gave the challenge to ANDRITZ.

A new design

Greg Hallas has worked around wash presses for about 20 years. He knows the designs, the strengths, and the limitations well. "There are twin roll displacement press designs that can result in poor washing efficiency and limited throughput," he says.



▲ Canfor Pulp is the largest North American producer of market NBSK pulp and is the leading producer of bleached, high performance kraft paper. It owns and operates three mills in Prince George, British Columbia. The Intercontinental Mill shown here is the site of the first installation of the Multi-E-Nip press upgrade.

"Plugging in the tapered headboxes, plugging in the vat, low feed consistencies, poor wash distribution, and low discharge consistencies are all potential problems."

When he joined ANDRITZ, Hallas worked with an international team to design products which would improve the performance of existing presses. Following a months-long development program, including collaboration with ANDRITZ's Todd Grace (Vice President, Product Management) in the USA and Pekka Tervola (R&D Engineer) in Finland, they were ready to present their innovative upgrade solution to mills looking for better washing efficiency and/or capacity increases.

The timing was excellent because Canfor was ready. "ANDRITZ came to us with their idea – keeping the low consistency, but really make a big improvement," Parfitt says. "Every time we presented the concept internally, people got excited about it. They could see how it would fit our operation, giving us all the benefits for a reasonable cost."

In the case of Canfor, Hallas had an advantage. He was at the mill for the original start-up of the two Sunds DPA-1255 units. "Some of the people that I worked with then are still here," he says. "I have earned some credibility with them."

The Multi-E-Nip upgrade is born

When Hallas first presented his ideas, the upgrade product did not have a name. In fact, there were only conceptual sketches to explain the concept. "The actual design changed some since the original sketches," Hallas says, "improving during each discussion between customers and our global design team."

The original proposal called for a feed distribution screw. Concerns about adding more moving equipment to an existing press during the upgrade, which would also increase energy consumption and might cause plugging issues were raised by Canfor. "Listening to those concerns, we simplified the design so there was no moving equipment," Hallas says. "We would not have to

upgrade the auxiliaries and could bolt to the existing vat."

With the design solidified, the product was given a name: Mult-E-Nip upgrade. The "Mult-E" stands for multiple wash zones and multiple nips. The "E" also stands for E10 improvement and washing efficiency. It is a unique solution for low-consistency (2.5 to 6%) applications and the technology can be applied to medium-consistency (6-11%) as well.

The center feed design distributes the pulp more uniformly than the corner feed design of the original press. It also allows for higher feed consistencies. The pulp enters the press higher on the press roll, utilizing more of the screen area for dewatering. There are two locations for introducing wash water, and there are multiple nips. These features all contribute to higher washing efficiency.

How much higher? About 18-24% improvement. If additional capacity is needed, an improvement in the neighborhood of 28% is possible.

From sketch to reality in 18 months

Since this was the first ever Mult-E-Nip upgrade, and their first look at it was through Hallas' hand-drawn sketches, Canfor chose

to upgrade the #1 press first so they could bypass it if there was a problem. The contract with ANDRITZ was signed in January 2013.

With field measurements in hand, the team at the Delta Service Centre (see story on next page) began producing working drawings and fabricating the unit.

When the equipment arrived at the mill in July, the transformation of the wash press began. The feed system was converted from corner feed to center feed. The wash zones were added and the low consistency feed assembly was installed. The installation took six days. "Based on what we know now, and with our planned fabrication improvements, we think we can do the next one in four days," Hallas says.

"We now run at higher feed consistencies and have no plugging. The press just runs and we don't have to babysit it."

Kelly Parfitt
Project Engineer
Canfor Corporation



Greg Hallas, ANDRITZ (left) with Kelly Parfitt, Canfor. ▶

"We explored an innovative new option with ANDRITZ and then watched it materialize into exactly what we needed," Parfitt says. "We were on the edge of our seats when it started up. It was exciting to be a part of it."

From ANDRITZ's side, the evolution of the product – from a conceptual sketch to actual installation to excellent results all within 18 months – was also exciting.

A partnership as promised

"We entered into this partnership with ANDRITZ cautiously based on our experiences with other suppliers," Parfitt says. "But coming out of it, I have to say I am very pleased. ANDRITZ stayed with us until the press ran beautifully."

The mill has evaluated the E10, displacement ratio, and all the criteria that are part of the performance guarantee. "We are seeing improved displacement ratio, improved E10, and improved operability of the press," Parfitt says. "Before the upgrade, we had trouble with plugging headboxes and things like that. We now run at higher feed consistencies and have no plugging. The press just runs. We don't have to babysit it."

A big part of optimization is sharing data with operators so they can know just how far to push the press. The upgrade offers considerable flexibility, so the mill is running bump tests to understand the impact of feed consistency, the split of wash water between the two zones, and torque settings to get good discharge consistency.

"This year, we have big projects in the green energy area that are consuming capital, but I'm very sure we will upgrade POW #2 next year," Parfitt says. "Our sister mill (Northwood) is also evaluating a Mult-E-Nip upgrade. Looks like we will see our friends from ANDRITZ around here for awhile."

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The Delta connection



ANDRITZ PULP & PAPER acquired the assets of Tristar Industries Ltd., and restarted the high-quality rebuild and manufacturing facility in Delta, BC (just outside Vancouver) in the fall of 2011. The facility is now known as the Delta Service Centre (DSC).

DSC manufactures and rebuilds equipment such as digester feedline equipment, vacuum washers, twin roll presses, thick stock pumps, and other equipment. The experi-

enced employees, reputation, and location made it ideal to manufacture the first Mult-E-Nip – the upgrade destined for Canfor.

Wayne Leary, Operations Manager, says that the first Mult-E-Nip project was an interesting challenge. "When Greg Hallas brought in his design concepts, the first thing we did was have him work with Zeljko Sirovjevic in Engineering, who turned the concepts into working drawings," Leary says. "Then we sat with our most experienced machinists, welders, and fabricators to arrive at a tactical plan for building the equipment."

The Mult-E-Nip unit, which is constructed of stainless steel, had long welding passes. "The welding process tends to distort the stainless, so we had to carefully plan the welds and the points for stress relief. The use of vibratory stress relief equipment made this easier. We were able to maintain the final tolerances, but it was demanding work."

◀ Jacob Townsend (left) and Wayne Leary of Delta Service Centre.



▲ Rainer Kojo was project manager for the Mult-E-Nip work at DSC.

According to Rainer Kojo, Project Manager for the Mult-E-Nip work at DSC, there were some other important learnings. "For the next unit, we will use some formed pieces that will put the ridges in a different direction to reduce distortion," he says. "I'm sure the fabrication will be more efficient."

Leary, Kojo, and their team are anxious to build the next Mult-E-Nip. "Hearing that Canfor is pleased with our first one is the best news," Kojo says. "That is what it is all about."