

## Refiner rebuild provides cost-effective route to increased capacity – and competitiveness.

How F. F. Soucy used new technology to increase individual refiner productivity by nearly 1/3 – saving 65% of the cost of a new installation.

### **LOWER CAPACITY + LOWER MARGINS: OLDER NEWSPRINT MILLS FEEL THE PINCH.**

In an industry subjected to intense competition, perhaps no segment is under pressure more than newsprint producers. Margins for newsprint grades remain razor thin, which means mills have to get the greatest ROI and productivity out of every dollar- whether it's spent on capital equipment, operating costs or raw materials.

Older newsprint mills are particularly squeezed. Their aging installed technology limits capacity growth and mill competitiveness. However, replacing old equipment and process lines with new technology can have its share of risks, too - from the sheer cost of purchasing the new technology, to production disruptions and extended startup times caused by integrating new (and unfamiliar) technologies, controls and processes into an existing infrastructure.

This is precisely the dilemma faced by the F.F. Soucy newsprint mill in Rivière-du-Loup, Quebec. Its four primary refining lines all relied on Andritz Double Disc refiners. The Andritz refiners had given excellent service for over 20 years. But with maximum production of 600 t/d from all 4 lines, the existing refiners did not have the size or power to fully meet the mill's capacity requirements. As a result, Rivière-du-Loup's production was limited, which increased per-ton costs while further reducing margins.

To remove the bottleneck, mill management had essentially two choices: add brand new refining capability, or rebuild the existing lines. Obviously, new refiner lines would allow the mill to take advantage of the newest, most efficient mechanical pulping technology - but at a high cost. In addition, possible physical plant restrictions could inhibit the running of old and new refining lines simultaneously during start-up. But could a rebuild of 20+ year old refiners provide



the mill with all the additional capacity needed to meet the mill's expanding requirements?

### **INTEGRATING ADVANCED TECHNOLOGY ONTO AN EXISTING PLATFORM.**

The answer came from a division of Andritz Ltd. that specializes in refiner rebuilding technologies. They put together a proposal that promised to raise total refiner capacity by at least 160 T/D - obtained solely by rebuilding the 4 existing lines. This would give Rivière-du-Loup the additional capacity it needed to become more competitive. Best of all, the complete cost of the rebuild would come to roughly one-third the cost of adding a new refining line.

To meet the application requirements, virtually new refiners would have to be built on-site at the mill- only the refiner bases, lubrication and

hydraulic systems would remain from the old Double Disc units, and even these reused components would be upgraded. Everything else would be replaced. Refiner discs were increased in size from 52" to 56", while new rotating assemblies, enclosures - and particularly, motors - were installed.

In order to produce the specific energy required to increase each refiner's throughput by 40 t/d, primary motor power had to be increased by over 50% - from 9,000 HP to 14,000 HP per motor. However, due to existing physical plant restrictions, these new motors could be no larger than the far less powerful ones they replaced.

A few years ago, this restriction would have probably doomed the project: there simply weren't any motors that were powerful enough - yet small enough - to fit in the application's dimensional envelope. But Andritz Ltd. engineers knew of a recently-developed technology from G.E. that gave electrical motors an unprecedented size-to-power ratio. These synchronous motors also used brushless excitation technology, which eliminated maintenance costs associated with motor brushes.

With these powerful, compact motors providing 50% more refining energy to the larger refiner discs, Andritz Ltd. engineers were able to raise each refiner line's output from 150 t/d to 190 t/d - a capacity increase of nearly 1/3.

#### **REDUCING INSTALLATION TIME, COST - AND RISK.**

Designing a rebuild to fit the needed capacity within the existing mill was one challenge. Installing it to ensure minimal disruption of mill activities was another. While each line was being rebuilt, the mill would lose one quarter of its total refining capacity - a condition that could not be tolerated for long.

Fortunately, by going with a rebuild sourced from Andritz - the same supplier that had provided the original refiners - the mill was able to rely on known technologies and a known supplier in order to minimize installation and start-up problems.

First of all, Andritz backed the rebuilt refiners with the exact same warranty offered on new refiners. So Rivière-du-Loup was not only getting virtually new refiners with the rebuild, the mill was also getting the same guarantees (and peace of mind) as they would with a new installation.

Since these new refiners were being built on existing bases, no building or foundation work was required. As a result, the rebuilders were

able to cut valuable time (and costs) out of the installation procedure.

Maintaining the existing double-disc refiner configuration meant that existing control, instrumentation, and even maintenance strategies could be preserved. This reduced installation time even further - and greatly streamlined start-up, since virtually no new training would be required.



Therefore, each rebuild only took 4 or 5 days to complete, a fraction of the time that would have been required for new construction - or a less-compatible rebuild. And once the installation was complete, start-up occurred in a matter of hours - in one case, the re-engineered refining line was first started at 10 AM - and was fully functional by noon!

As part of the upgrade, the original Bauer cyclones were replaced with the latest high efficiency technology. This produced more complete steam and fiber separation which reduced pressure drop, eliminated cyclone plugging - and prevented low load trips in the secondary refiners. Also, the primary refiners were able to run at a lower, more favorable pressure differential, which reduced shive content - further increasing quality.

#### **MAXIMIZED COMPETITIVENESS - FOR A MINIMAL INVESTMENT.**

The rebuild at Rivière-du-Loup shows that today's refiner rebuilds can successfully integrate the latest innovations into decades-old equipment - giving an existing refiner line capabilities and capacities that rival brand new systems, all at a fraction of the cost. As a result, older mills can regain - and maintain - their competitiveness, well into the future, even in the most cutthroat market segments.

