

SPECTRUM

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MAGAZINE OF PULP & PAPER 



NO EFFLUENT

Visy's Tumut mill in Australia
(Page 4)

PEAK PERFORMANCE

Rebuild at Italy's Reno de Medici
(Page 18)

ELDORADO SPIRIT

World's largest pulp line in Brazil
(Page 22)

CREATIVE CROFTON

Catalyst's TMP success in Canada
(Page 34)

A sample of mill discharge from Visy's Tumut mill in Australia BEFORE water treatment. The mill has closed the water loops so that no effluent is returned to the river.

ANDRITZ
Pulp & Paper

CONTENTS

3 MANAGEMENT MESSAGE

4 ZEROING IN



10 EXTREME MAKEOVER



14 CUTTING EDGE SERVICE



18 PEAK PERFORMANCE



22 SPIRIT OF ELDORADO



29 OPPORTUNITY



34 CROFTON GETS CREATIVE



38 SUSTAINABLE PROJECT



43 SAFE AND SOUND



46 NEWS

MINING THE TISSUE INDUSTRY

Fushun Mining Group is a state-owned coal and oil shale company in China's Liaoning Province. The Group has more than 40,000 employees. The decision to add tissue production to the portfolio required Fushun to select its technology partner very carefully.

ANDRITZ delivered the stock preparation technology, a PrimeLine tissue machine, and the automation systems for the new plant. Capacity is about 60,000 t/a and the furnish is virgin fiber. The machine started up at the end of October 2011. This is one of the 18 high-speed tissue machines that ANDRITZ has delivered to China.

Next issue of Spectrum: the start-up of the Fushun tissue plant and interviews with key executives to discuss their decision to enter the tissue business in China.



You will see the use of both "tonnes" and "tons" in this publication: tonnes for metric units and tons for American units. Spectrum is published in five languages; English, Chinese, Russian, Japanese, and Portuguese. Copyright© ANDRITZ AG 2012. All rights reserved. No part of this publication may be reproduced without permission of the publisher.

UP AND OUT

"We look down so we do not stumble. We look inward to correct our deficiencies. When do we take time to look up and out?"

It was an "Aha!" moment this summer.

While dayhiking in the Austrian mountains, we noticed something. When the trail was smooth, we looked around and enjoyed nature. When the path was filled with rocks, we looked at our feet to avoid falling. Our range of vision was about four meters ahead of us.

The "Aha!" came when we realized that many businesses operate just like hikers. When things are good, they look up at their vision and strategies – and around to

their customers and suppliers. As soon as things get rocky, they watch their step and narrow their vision.

Do businesses that look "up and out" capture more opportunities than those that focus "down and in"? We are about to find out. The global economy is slowing down. World economic prospects seem to turn on events, the nature and timing of which are highly uncertain. Contrary to what analysts predicted earlier, we are not out of the woods yet.

Up and out with confidence

The difference between the upside and the downside scenarios reflects the impact of credible, confidence-building actions. As engineers, we focus on technology. We can build confidence by actively develop-

ing these technologies – or leveraging new ones – to reduce operating costs and increase efficiency. This is the key to survival for most mills.

Many mills are transitioning to higher margin products or new grades to meet their customers' future demands. These transitions require rebuilds and/or relocation of assets. These mills are rebuilding more than just the hardware – they are rebuilding confidence in their employees and customers while getting aligned for the next up-cycle.

We at ANDRITZ have the expertise to develop the technology, provide the services, and assist with rebuilding and modernizing equipment. We hope you will continue to take maximum advantage of that expertise in 2012.

Humbert Köfler
Member of the Executive Board
PULP & PAPER – Service and Units



Karl Hornhofer
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Zeroing in on waste brings Visy big returns

When Visy Industries launched its first integrated pulp and paper mill on a former cattle farm near Tumut in New South Wales, Australia, it was strategically located near an ample supply of state-owned radiata pine plantations. Other than proximity to the forest, the business model was not based upon traditional thinking.

Says Johan Stoltz, Visy Tumut's Manufacturing Manager, "A decade ago, Visy had the vision to manufacture first quality kraft pulp and kraftliner using the extreme minimum amount of fresh water and zero effluent to the river. Right from the start, we used 4 m³ of water per tonne of paper, reusing machine whitewater as our principle freshwater resource. Now, we are down to 3.5 m³."

Adds Jean Yves Nouaze, Visy Tumut's General Manager, "Doubling paper output to 700,000 tonnes per year and adding a second paper machine has only marginally increased our water volume. We still have no discharge into the river. Because we are located in an area with an increasing

amount of outdoor recreation, our commitment to the environment is highly valued by the community."

Stoltz largely attributes the decreases in water consumption and steam consumption per tonne of product to the Vapor Compression Evaporator (VCE), which efficiently recycles the process water and places no additional load on the cooling towers.

More than integrated – interconnected

For those familiar with the configuration of pulp and paper mills, the arrangement of equipment at Tumut is not exactly what would be expected.

"Minimal usage of freshwater, combined with putting no effluent in the river, makes Visy Tumut a model for other kraft linerboard mills in the world."

Johan Stoltz, Visy Tumut's Manufacturing Manager

Johan Stoltz (left) with Allan Sycamore, ANDRITZ's Local Sales & Project Support Manager ▼



◀ Phill Johns, Tumut's Field Process Controller, holds a sample of mill discharge before the final water treatment plant. Note the color and clarity of the water. No water is discharged as effluent to the river.



Visy Tumut is actually an "interconnected" paper mill, not simply an integrated mill. The physical layout places evaporators in a central location in relation to the other pulp and paper equipment. "This entire mill works as a single, interconnected unit," Stoltz says. "The VCE pre-evaporator and the multiple-effect evaporators play a central role here – stripping away contaminants and providing clean condensate for use throughout the mill. Washers are strategically placed to maintain water quality at a level where it can be continuously reused.

"Balance is what we are about," Nouaze adds. "All operators and workers have the mindset to support rapid adjustments, wherever they need to happen, and are trained to maintain this high level of readiness and efficiency."

"Pure" water

The 200 t/h pre-evaporator (RecoVap VCE from ANDRITZ) was installed as part of the Phase II expansion project (see sidebar on page 7). It uses a 4 MW motor and a "heat pump" principle to minimize energy usage. Weak liquor from the digester enters the VCE for evaporation and a compressor increases the pressure of the vapor produced. The pressure increase also increases the condensation temperature so that the same vapor can serve as the heating medium for its "mother" liquid. The recompressed vapor condenses and releases its heat to evaporate water from the weak liquor. At Visy, there is also a slight

excess of heat that is utilized to heat the demineralized water for the boilers. Clean condensate is sent directly to the condensate system; foul condensate goes to the stripper.

Says Uday Bhagwat, Area Manager for Chemical Recovery, Power & Utilities, "The VCE pre-evaporator is ideal for our closed system. We could have installed a traditional six-stage evaporator train, but that would have required the installation of another power boiler to supply steam. We prefer the simplicity of the VCE. This installation, combined with modifications to our original system, produces very clean condensate and quite pure water over and over again."

Just-in-time throughout the mill

Bhagwat reveals there are only 10 people per shift running the pulp mill without many of the traditional buffers (e.g. storage of process water between functions). This requires close communications and "being

▲ Visy is home to the world's largest pulp mill VCE evaporator, delivered by ANDRITZ (in foreground). It is central to the mill's ability to minimize fresh water usage. In the background is the new ANDRITZ recovery boiler, expandable to 1,100 tds/d, which plays an important role in eliminating mill odors.



▲ Visy has restored local pioneer homes on the property with great respect to the original structures.



prepared to act fast to shift the balances of process waters if necessary. There is little room for upsets or error.”

Most of the mill’s fresh water goes to the boiler via a demineralization plant (reverse osmosis), to the turbo-generator cooling towers, to the seal water system, and for potable water. The entire volume of water inside the mill, including all the mill liquors and the paper machine, is a surprisingly low 9,000 m³/d at full production.

Adds Stoltz, “The available water balance of 9,000 m³/d can present a challenge when we have production rate changes or upsets in the operation. Our safety net is a 6,000 m³ pond which is available for emergencies and the annual shutdowns. Actually, this tight operating envelope has a positive effect in that it helps us to focus. We have designed in little margin for error, which compels us to plan ahead and react quickly to any potential upsets – or avoid them completely.”

Partnership role

In addition to the evaporation optimization, ANDRITZ was the supplier of key pulp mill technologies and the balance of plant (BOP) engineering for new and existing systems during the mill expansion.

Jarmo Orantie was the Project Director who headed up global coordination with ANDRITZ’s business units and sub-suppliers. Overall project direction and the project execution for fiberline, recovery boiler, and evaporator technologies were handled from the USA, while the white liquor plant was managed from Finland. Balance of Plant (BOP) engineering was led from Finland, with local support from Australia and New Zealand. Recycled fiber and paper machine approach systems were handled from Austria. As a result of global sourcing, subcontractors were selected from Australia, North America, China, India, and several European countries.

Digester produces more than twice as much pulp

According to Allan Sycamore, ANDRITZ’s Local Sales & Project Support Manager,

“Visy Tumut’s digester handles more than double the original throughput because, among other things, it was converted to Downflow Lo-Solids cooking and our TurboFeed chip feeding system.”

Eduardo Manias, Pulp Mill Manager, notes the improvement. “By modifying our existing digester, we were able to keep capital costs down,” he says. “We converted from upflow to downflow, which permits us to use almost the whole digester vessel to cook. Wash circulation at the bottom became the primary extraction screens. “And now, even though our digester runs double capacity, it requires only two chip pumps. This keeps things flowing at a smooth, rapid pace. The TurboFeed chip feeding system with DiamondBack chip bin are valuable contributors to consistent throughput.”

“Our commitment to the environment is highly valued by the community. Our success is closely tied to their continuing support.”

Jean Yves Nouaze, General Manager of Visy Tumut Mill

(Left to right): Allan Sycamore from ANDRITZ, Uday Bhagwat, Eduardo Manias, Neil Louwrens, Paper Mill Manager Altair Zolio, Johan Stoltz, and Jean Yves Nouaze standing in front of Visy’s VCE pre-evaporator. ▼



▲ A second white liquor plant (shown above) from ANDRITZ was part of the expansion.

According to Altair Zolio, who manages the fiberline and white liquor plant, “Before the upgrade, our digester extraction lines had a lot of calcium carbonate scaling. We decided to install a bypass line to get Lo-Solids back online. This change has worked very well. For long-term efficiency, we developed an acid washing process for the digester vessel and circulation lines. This purge dissolves all calcium carbonate scale.”

For white liquor production, a new ANDRITZ recausticizing line was installed with a capacity of 1,600 m³/d. The plant includes an X-Filter for green liquor filtration, a two-stage disc filter for lime mud dewatering, and a CD-filter for white liquor filtration. A new lime mud dryer (LMD) kiln has a capacity of 125 t/d of burnt lime.

ANDRITZ also delivered a second blowline refiner, a two-stage DD Washer, and an MC deshive refining system followed by a screw press to the existing fiberline.

Recovery boiler’s second job – odor reduction

It is notable that the new ANDRITZ recovery boiler, which complements an existing unit, is designed to be expanded to 1,100 tds/d. Currently it is operating at about 900 tds/d. But, in addition to its primary function in chemical recovery, killing off odor is an important aspect of performance. The boiler has a modern air distribution system allowing it to meet the most stringent emissions requirements.

The existing ANDRITZ continuous digester was converted to Downflow Lo-Solids cooking to more than double its original capacity. A TurboFeed chip feeding system was also added. A new two-stage DD Washer was part of the expansion project. ▼



VISY TUMUT’S PHASE II EXPANSION

In 1948, Visy started out in Melbourne as a manufacturer of corrugated boxes. It has since grown to become one of the world’s leading packaging, paper, and recycling companies – employing over 5,500 people and operating in over 100 locations across Australia, New Zealand, Thailand, Vietnam, and Malaysia. Visy also has a “sister” company, Pratt Industries USA, which employs an additional 3,500 in North America.

Doubling capacity in 2009 to production of 700,000 t/a, the Visy Tumut pulp and paper mill began operations as a greenfield facility in 2001. It achieved exceedingly low fresh water consumption (<4.1 m³ per tonne of paper), producing no liquid effluent. Visy Tumut, a model for sustainability, has recently won the prestigious Australian Business Award for environmental sustainability.

Two paper machines produce a range of unbleached paper grades, comprised primarily of fiber from pine from local plantations, sawmill chips, and recovered fiber. Tumut’s renewable and cogeneration power facility uses bark and sawmill waste to generate about 42% of their electrical requirements.

For Phase II, ANDRITZ served as a strategic partner to double evaporation and digester capacity, deliver a new recovery boiler, recausticizing plant, a second lime kiln, recycled fiber systems, and paper machine approach. In addition, ANDRITZ performed the Balance of Plant (BOP) engineering that tied all systems together.



“Before the upgrade, our digester extraction lines had a lot of calcium carbonate scaling. We decided to install a bypass line to get Lo-Solids back online.”

Altair Zolio, Area Manager for Fiberline & White Liquor



“By modifying our existing digester, we were able to keep capital costs down. Keep in mind that we more than doubled capacity, made possible with some very creative thinking and application of technology.”

Eduardo Manias (left), Pulp Mill Manager

“Because we have little storage of process water, we are always alert and on our toes. Upsets don’t happen very often, because we watch all key parameters very closely.”

Uday Bhagwat (right), Area Manager for Chemical Recovery, Power & Utilities



Ever concerned about environmental performance, ANDRITZ’s green liquor filtration and dregs handling equipment work without lime mud precoat, which decreases waste to landfill by as much as 50%. ▶

Says Stoltz, “Part of our commitment to the community is minimizing odor. We place a high value on the ANDRITZ boiler’s ability to produce low-odor emissions. We force odorous sulphide compounds from the various processes into a gaseous phase so they can be collected and destroyed in the recovery boiler. The result is a measurable and noticeable improvement in the atmosphere.”

Community and commitment

“In the late 1990s, having any kind of pulp mill here was an issue,” says Ben Casauria, Tumut’s Environment and Community Manager. “We had a real selling job with the community.”

The local people wanted nothing to detract from the beauty of Tumut and this region. Air quality and odor were real concerns. “Our continuing efforts to contain and burn the gases that cause odor are paying off,” Casauria says. “We had to earn respect and trust of the people, which is now evident through our expansion and support for our success.”

The synergy with New South Wales Forestry, who manages local pine plantations, is an asset to maximizing forest yield and minimizing forest fires. “Because Tumut is largely a timber town, we are seen as part of the circle of success, using waste products from the sawmills and trimmings from the forest,” adds Casauria. “Forest production is higher, and control of fires has taken a step forward by clearing out what would have become dead wood.”

Even the local kangaroos and wombats are taken into consideration, as corridors have been created from the hills above the mill down to water sources in the valley.

The use of VCE technology contributes to this. It provides an elegant form of condensate segregation so that 90% of the MeOH and 95% of the TRS is captured, segregated, and removed in a concentrated stream for stripping. Now, much less odorous components enter the multiple-effect evaporators.

Relationships matter

Manias points to the importance of including key suppliers as part of Visy’s team. “Every ANDRITZ person has an open access to our management team and departments like engineering or maintenance,” he says. “We see a benefit to direct contact. Talk with an operator or me, and move forward faster.”

Sycamore adds “Open communications between Visy and ANDRITZ contributed to the success here at Tumut. We appreciate working in an open and supportive way as we all have the same goal – a successful project.”

▼ Trimmings from local pine plantations fuel the pulp mill and allow foresters to maximize yield.



The future

A directive from the owners of Visy Industries is to turn waste into energy. For this reason Visy Tumut could put a 70 MW power facility in place that would feed energy to the grid.

To make even greater use of fiber resources, Zolio believes that raising the Kappa number could contribute to considerable savings in fiber costs. “We have set 105 Kappa as a goal,” he says. “While we are at 93 now, we see the potential of a 3% yield increase. Our cooking process can handle this boost, but refining would need to change.”

Adds Nouaze, “Greater utilization of local pine and the potential for higher use of recovered fiber will contribute to our sustainable success. Using waste to produce more power than we need is also on the table. There are always ways to advance progress for the mill and the community where we live.”

FIND OUT MORE AT www.spectrum.andritz.com

NATIONAL PARKS & WILDLIFE SERVICE

Shane and Talea guide tourists on bush walks in the Snowy Mountains, where they demonstrate ancient aboriginal knowledge of ropemaking from bark, stone tool-making from riverstones, and other customs practiced in the region for thousands of years. Their ancestors date back to the last Ice Age or perhaps even earlier – more than 16,000 years ago.

(Left to right): Shane Herrington, Mark Lees, Visitor Services Manager, and Talea Bulger, National Parks & Wildlife Service, Tumut, New South Wales, Australia, standing in front of the Visy display at the Tumut visitors center. ▼





Extreme Makeover: PM edition

A popular American television show is “Extreme Makeover: Home Edition” where a design team totally rebuilds a home for a family in record time. ANDRITZ is involved in an “extreme makeover” of another type: helping SFT Group disassemble a mothballed paper machine, transport it, and reconfigure the machine for a different type of paper production.

The SFT Group, one of Russia’s fastest growing companies in the corrugated packaging sector, is taking bold steps to grow its business in a new direction. In the process, the Group is placing its trust in the theme of ANDRITZ PULP & PAPER (“We accept the challenge!”). SFT selected ANDRITZ to provide project support, project management, and on-site services for the dismantling of a mothballed paper machine in Finland and its relocation to Russia – and then rebuild it as a modern production unit for fluting and testliner at its Kamenskaya mill.

“At first, we discussed buying a new machine with an annual production of 350,000 tonnes, but the capital required is beyond our means,” says Valeriy Glazyrin, a member of SFT’s supervisory board. “Plus, we don’t yet have enough waste paper raw material in Russia for such a large machine.”

On the other hand, SFT knew that a small used machine would not be profitable. “The optimal size is about 250,000 t/a,” says Stepan Khomyakov, CEO of the SFT Group.

The used machine that best fit SFT’s needs was installed at UPM’s Kymi mill in the 1970’s. It produced bleached machine-glazed kraft paper before being shut down in 2006. It is now being dismantled for transport. ANDRITZ is supervising the work as each piece is condition-checked, repaired if necessary, marked for reassembly, and packed in 250+ containers to be shipped to Kamenskaya. Once in Kamenskaya, the machine will be installed and rebuilt for the production of 250,000 t/a of fluting and testliner.

Socialism to Capitalism

The executives who formed SFT started their industry history as managers of the Baikal Pulp & Paper Mill in Russia. With the



▲ Stepan Khomyakov, Chief Executive Officer (left); Anatoly Shteynberg, Chairman of Supervisory Board (center); Valeriy Glazyrin, Member of Supervisory Board

fall of the Iron Curtain, they had to strike a new path. The company accepted the economic changes in Russia in the beginning of the 1990’s and changed from a state-run enterprise to a Joint Stock Company. Baikal Pulp & Paper had to find new clients and develop new products and was the first among Russian enterprises to enter China and other Southeast Asian markets with its production.

Anatoly Shteynberg was Chairman of the Board of Directors of Baikal Pulp & Paper from 1995 to 2002. Valeriy Glazyrin was General Manager. As Shteynberg explains, “Due to circumstances beyond our control, in 2002 we were forced to leave the mill where we had worked for about 30 years. We moved to Moscow to establish our new business there. It was a difficult decision, as it meant a complete change of lifestyle for us. We offered some managers of Baikal

Pulp & Paper the chance to go with us to Moscow and take the risk of creating business together. Everyone we asked to move with us agreed to go.” One of those who agreed to move was Stepan Khomyakov, who now is Chief Executive Officer of SFT.

Shteynberg, now Chairman of the SFT Supervisory Board, vividly remembers how he spent hours reading the annual journal *Pulp and Paper in Russia, Ukraine, Belarus, and Kazakhstan*. “For our new business,” he recalls, “we had to find a segment with a low cost of entry and with good growth prospects. Our focus turned to the production of packaging papers from recycled fiber.”

In the Soviet planned economy, packaging production did not receive much attention. There were a few small mills producing cardboard from recycled fiber. Almost all



"We know that there are many risks. But we also know these risks can be minimized with a good partner, and this is ANDRITZ."

Anatoly Shteynberg, Chairman of Supervisory Board

of them were low-grade and unprofitable, according to Shteynberg. "These mills supplied linerboard and fluting for corrugated packaging, and they were not very modern. Most importantly, the segment has not been consolidated. Russia is seeing an increase of packaging consumption up to 14% per year, and all the converting plants are working profitably."

Energized by this potential, the SFT Group purchased the Kamenskaya Board & Paper Mill in July 2003. Production volume at the time was about 40,000 t/a of cardboard. Included in the purchase was a converting facility with the capacity for 35 million m² of corrugated products per year, but the plant was not profitable. "We began step-by-step to develop a domestic market for recycled cardboard and corrugated board," Shteynberg says. "By the end of 2003, the plant made a profit of 14 million Rubles."

This was the beginning of success for SFT. Since 2006, the Group has increased turnover eightfold and EBITA by a factor of 12. Today, SFT has four paper mills, with sales of about 170 million Euro. This year, the

mills utilized 200,000 tonnes of waste paper (OCC). It is the only fully integrated producer in Russia: from the collection of waste paper to the production of the corrugated cases.

Ambitious goals

SFT Group's goals are ambitious. The production of testliner, fluting, and cardboard is planned to increase to 700,000 t/a, with converting production rising to one billion square meters. At this level, the company will reach its target of producing 40% of the nation's testliner and fluting. "For our young company, this project is the biggest in terms of investment costs and scale of work involved," says Khomyakov. "Our goal is to use the old machine as the basis to obtain a leading edge machine capable of producing top quality products for packaging producers."

As part of the machine rebuild and conversion, ANDRITZ will add its components for the press section (*PrimePress X* shoe press) and drying section (*PrimeDry* drying cylinders). The *PrimePress X* delivers energy savings as well as reducing the number of sheet breaks. The *PrimeDry* cylinders pro-



▲ Each piece of the dismantled machine is inspected, condition noted, and tagged before being placed in one of 250+ containers for shipment to Russia.



"Our goal is to use the old machine as the basis to obtain a leading edge machine capable of producing top quality products for packaging producers."

Stepan Khomyakov, Chief Executive Officer of the SFT Group

"At first, we discussed buying a new machine with an annual production of 350,000 tonnes, but the capital required is beyond our means."

Valeriy Glazyrin, Member of Supervisory Board

vide more efficient drying and will boost the machine's production capacity. The wire and reel sections will also be modified. When completed, the "new" PM No. 7 will have a design speed of 1,050 m/min with a trim of 4,600 mm.

The work is complex. ANDRITZ experts prepared the overhaul master plan, including contingencies for difficult overhaul tasks. Detailed work-hour and space planning, in cooperation with the customer, has also been completed. ANDRITZ will also assist in the selection of the erection vendor and supervise all the work done on-site in Kamenskaya. Erection checks and inspections of the machine subsystems (hydraulics, gears, balancing, etc.) are also in the scope.

For SFT, it was determined that there was one supplier who could provide the needed answers and solve the potential problems. "We know that there are many risks," Shteynberg says. "But we also know these risks can be minimized with a good partner, and this is ANDRITZ."

For pulp supply, SFT also ordered a new recycled fiberline from ANDRITZ, includ-



ing paper machine approach and broke handling systems. The recycled fiberline will process 800 bdmt/d of mixed waste and OCC from Russia. ANDRITZ will also provide the complete automation system (process control and quality control) for the new machine.

"This project is a great challenge," Khomyakov says, "not only for technical and logistics reasons, but also for the investment targets we are working towards. We have established a target to implement this machine spending no more than 350 Euro per tonne of capacity. So, we were very careful in choosing a partner for this project. ANDRITZ people have the experience and skills to not only do the work, but also to give us technical advice during the whole project and longer term."

At the moment, the machine is on its way to Kamenskaya, and the experience with ANDRITZ up to now has been quite good, according to Khomyakov. "We had great support during the planning and disassembly. ANDRITZ has specialists for every part in the project, so we are very optimistic."

▼ A view of the machine room at UPM Kymi's mill where the machine is being dismantled and inspected. ▼



Cutting edge synergy and service

While pouring milk into their breakfast coffee, people hardly think of the importance of well-working service in a pulp mill. For high-quality liquid packaging board producers, the performance of their pulp supplier is a key issue. ANDRITZ acquired Iggesund Tools in July and now offers a combined capability for wood processing departments, mainly chipper knife systems, which helps mills improve their pulp quality and become more cost-effective.

Quality requirements are especially high when the end product is used for liquid packaging. The final packaging product must be absolutely clean, easy to print on, and highly functional in terms of shape, strength, and barrier protection. That is why a manufacturer of cartonboard for several liquid packaging board producers, the Korsnäs Mill in Gävle, Sweden, relies on ANDRITZ Iggesund Tools for service and technology for their wood chipping.

Korsnäs is owned by Investment Kinnevik AB, one of the leading manufacturers of virgin fiber-based packaging materials primarily for consumer products. The mill in Gävle has an annual capacity of 700,000 tonnes of paper and board products, operating three machines. The integrated mill is largely self-sufficient in pulp.

Korsnäs focuses on value-added products such as special board used for beverage packaging, white top kraftliner (WTL) for the outer layer in corrugated packaging, and cartonboard for packaging cosmetics, luxury drinks, confectionery, and frozen food.

Good performance partners

"Korsnäs Gävle has been a loyal customer of Iggesund Tools since 1989," explains Henrik Frankenberg, the Managing Director for ANDRITZ Iggesund Tools' European business. "Even when the mill ordered a new 16-knife ANDRITZ HHQ-Chipper in 2003, the service and knife system came from Iggesund."

"We have had ongoing relations with both ANDRITZ and Iggesund over the years," says Thomas Björklund, Maintenance

Manager. "Our goal is to make chips that are 30 mm long and 4-5 mm in thickness, and this we do consistently. We had a very short start-up time for the chipper in 2003."

Igesund Tools' ScanChip measurement system for chip quality was in place during start-up. The supplier conducted a thorough training program for Korsnäs Gävle employees regarding knife handling and chip quality. Chipper performance and chip quality were followed for six years (2003-2009). According to Frankenberg, no other chipper installation in Sweden has had so much data collected.

When choosing a supplier, Korsnäs evaluates supplier reputation and superior quality. Service and parts availability is integral to the selection process, according to Björklund.

"We are amazed with the ANDRITZ HHQ-Chipper," Björklund says. "You can put almost anything into it, and it chips away without any problem – a remarkable piece of technology with such perfection, durability and performance."

"No doubts about getting the best service"

Igesund Tools has supplied knife systems for pulp mill chippers for many years. The company also provides debarkers, conical chipping heads, and drum chipping heads for sawmills. In addition to hardware, Iggesund Tools also offers repair and maintenance services, spare parts, operator training, and product performance evaluations for mills. ANDRITZ has similar products and services for woodyards (but not for sawmills), so the acquisition of Iggesund Tools by ANDRITZ provides plenty of synergy for customers.

"Initially, I was a bit worried when I heard about the acquisition because I thought it would limit our options," says Pär Johnsson, Production Engineer at Korsnäs Gävle. "It is not always a good thing when two excellent suppliers become one."

Johnsson says that there were no doubts about the two companies' capabilities in offering good service and solutions, but he was not sure how the structure would be – who would be doing what, and how they would continue.

"What we have always liked about dealing with both ANDRITZ and Iggesund Tools is that we could simply pick up the phone and they would assist us in solving a problem," Johnsson says. "We hope this continues in the same way in the future."



▲ Maintenance person inspecting the TurnKnife system – an easily manageable knife system with two edges – that produces the highest quality chips over the longest time.

SWEDISH TRADITION AND THE POWER OF INNOVATION AT ANDRITZ IGGESUND TOOLS

Igesund Tools – now ANDRITZ Iggesund Tools – supplies wood chipping and debarking equipment (mainly chipper knife systems) and related services for pulp and sawmills.

Igesund Tools' roots go back through several hundred years of industrial history. Iggesunds Bruk was founded in 1685 as an iron works. In more recent times, the plant produced sawn timber goods and pulp for paper and paperboard. And, of course, saw blades, knives, and debarking tools.

In 1983, the company was reorganized and the tools division became an independent company.

In July 2011, ANDRITZ announced the acquisition of Iggesund Tools International AB, including subsidiaries in the USA, Canada, and other countries. The acquired companies have approximately 160 employees.

A considerable amount of the company's revenue now comes from North America. The comprehensive PartnerChip program (knife systems, analytics, training, and service) is well accepted and adds value to many saw mills and pulp mills in the region.

"We have had ongoing relationships with both ANDRITZ and Iggesund Tools over the years. Service is a very important part of our supplier selection process."

Thomas Björklund, Maintenance Manager at Korsnäs's Gävle Mill.





▲ TurnKnife systems for chipper and re-chippers are supported by Dragos (knife changing robot) and ScanChip (chip quality analysis system).



“We set very high standards at Korsnäs because our customers set high standards for us. ANDRITZ and Iggesund Tools have always delivered. We look forward to this continuing with the combined company.”
Pär Johnsson, Production Engineer at Korsnäs Gävle

“Customers can now buy the best chipper in the world, equipped with the best knife system in the world, from one supplier.”

Stefan Marklund, General Manager for ANDRITZ wood processing in Scandinavia



▲ ANDRITZ HHQ-Chipper installed at the Gävle Mill. “A remarkable piece of technology,” according to Thomas Björklund

“We offer a new option for the future, combining what is best from ANDRITZ and Iggesund Tools.”

Henrik Frankenberg, Managing Director for ANDRITZ Iggesund Tools Europe

Frankenberg confirms this. “Korsnäs Gävle is a very sophisticated customer,” he says. “We have always worked very closely with mills, having people in place within a couple of hours when needed. This will not change.”

The Gävle Mill sets very high standards for ANDRITZ Iggesund Tools because its principal customers set very high standards for them. “ANDRITZ has always delivered, and the service continues to be outstanding,” Johnsson explains. “This is what we expect to see from the new ANDRITZ Iggesund Tools organization.”

According to Frankenberg, the new situation is that customers should not think there is only one option instead of two. “All the options are still there, but they come in one package from one supplier instead of two. In fact, there is now a third option for

the future, merging what is the best in our two worlds.”

Everything from one supplier

“With the acquisition, our customers will be able to buy the best chipper in the world equipped with the best knife system in the world from one supplier,” says Stefan Marklund, General Manager for ANDRITZ wood processing in Scandinavia. “We can also create extended, tailor-made services and maintenance packages for our customers.”

Through this new combination of companies, Iggesund Tools will benefit from being a part of a global company with extended reach. ANDRITZ will benefit by having access to unique, specialized knowledge within a small, but very important, segment of wood processing, for example the sawmill market. “Our customers will see

that this acquisition gives them a variety of benefits in the future,” Marklund assures.

Online support

Many sawmills in the region are running with ANDRITZ Iggesund Tools Power-Heads (chipping equipment) which are a high quality product. “Korsnäs Gävle was early in pushing for detailed service reports and chip quality data. Today, ANDRITZ Iggesund Tools offers all customers in Sweden online support to provide this important information,” Frankenberg notes.

Since PartnerChip includes everything from material and service to analysis of chip quality and training, ANDRITZ Iggesund Tools sees itself as supplying much more than just a knife system. For example, Korsnäs Gävle ordered the ScanChip for online sampling to follow the chip quality and to fine-tune the process –

and it has installed the company’s latest knife system, the TK-IV. “One benefit of the TK-IV is increased knife life – longer intervals between knife changes,” says Frankenberg. “This is very important for this mill as they mostly run only one chipper.”

Production efficiency is important

“Our customers are clearly interested in raising their overall production efficiency,” says Harri Qvintus, ANDRITZ’S Senior Vice President of service for Northern Europe. “The more comprehensive our product portfolio is, the better we can satisfy their requests and needs. Iggesund Tools has great products that help mills improve their pulp quality and become more cost-effective. Satisfied and profitable customers are our ultimate goal, and this acquisition supports that target very much.”



Peak performance to the mountain tops

The Reno de Medici Group of Italy is one of Europe's biggest cartonboard producers based on recycled materials. Its production capacity is split between mills in Italy, Spain, France, and Germany. ANDRITZ rebuilt the wet end of a folding boxboard machine at the Santa Giustina, Italy mill to give Reno de Medici a new top layer and more flexibility in meeting customer requirements in the coming years.



"We had to be sure of the approach, the design, the details, and the fact that ANDRITZ could accomplish this rebuild with very short downtime."

Francesco Canal, Santa Giustina's Mill Director

◀ Ivano Desimoi, Production Manager (left), Francesco Canal, (center) and Massimo Marcer, Technical Manager.

Reno de Medici's mill in Santa Giustina sits in the Valbelluna valley surrounded by mountains, about 100 km northwest of Venice and 90 km from Cortina, the "Pearl of the Dolomites." The valley is the starting point for treks across the Park of the Belluno Dolomites. The Santa Giustina mill has a production capacity of approximately 240,000 t/a. About 50% of the mill's production is destined for Italy, 25% for Europe, and 25% for Mediterranean and Middle Eastern customers. Among the most important customers are Barilla and Ferrero, and boxes for Panettone and Colomba.

"With the mountains as a backdrop, we aspire to great heights here," says Mill Director Francesco Canal. "In any project, we want to achieve the highest results so that each partner in the collaboration is able to win. This is also the way that ANDRITZ worked in cooperation with our engineering group and the installation company. It was very easy to work together and a good partnership was the result."

The project Canal is referring to is the rebuild of Santa Giustina's BM 1. It is not the first collaboration between ANDRITZ and Reno de Medici. The installation of a new

headbox at the Villa Santa Lucia mill and the start-up of PrimePress X shoes presses at Arnsberg (Germany) and Ovaro (Italy) are good references for the board machine upgrade at Santa Giustina.

Major changes

The target for the machine rebuild was clear: higher quality and higher production. "This was a very big modification for us," Canal explains.

"We developed the solutions and workflow together," says Mario Bernasconi, ANDRITZ Senior Sales Manager for paper



▲ Nestled in the Valbelluna valley, the Santa Giustina mill has the Pizzocco mountains as a backdrop. In the foreground, a "mountain" of recycled material that is the primary furnish for the mill's containerboard products.

and board machines. "All solutions regarding the control of the different machine sections were developed together. The Reno de Medici Group has a lot of mills producing different types of board. Each machine needs an individual solution."

To reach the mill's targets, ANDRITZ proposed to rebuild the forming section and make some other modifications. A new headbox (PrimeFlow SW) and fourdrinier wire (PrimeForm SW) would be added for the top layer. The existing suction former for the top ply would be replaced by this equipment. The five suction formers for the filler ply would be increased to six. The modifications would require reconfiguration of the transfer felt and equipping the existing back wire with a C-frame cantilever system.

To reach new production and quality targets, ANDRITZ rebuilt BM 1's forming section (new headbox and fourdrinier wire) and made other modifications. ▼



"We had to be sure of the approach, the design, the details, and the fact that ANDRITZ had a plan to accomplish this with very short machine downtime," Canal says.

Christmas present

BM 1 was stopped on 20 December 2010 and the machine was upgraded during the holiday. The work began with the dismantling of the first old frame of back ply. The dismantling work alone required five consecutive days around the clock. During the most intense work, 80 technicians worked 24/7 for 13 days. The crews removed 150 tonnes of iron, 50 tonnes of reinforced concrete footings, and four tonnes of power cables from the mill.

"You can think of this project as being similar to a pit stop in a Formula race," Canal says. "ANDRITZ was the professional pit crew. They had limited space and time, yet they were able to remove the used parts and put on the new ones to win the race."

BM 1 started back up on schedule (11 January 2011) to the delight of the Reno de Medici team. As Canal says, "ANDRITZ made very good work here. It is important for me to mention that it only took a short number of days to finalize the rebuild."

Upgraded quality and quantity

BM 1 has a design speed of 505 m/min and a wire width of 4,950 mm. The board produced is in the range of 230-500 g/m² with the furnish being mostly recycled fiber. The quality improvement potential was visible from the very beginning, according to Mario Wiltsche, Project Manager for headboxes.

"The start-up in January went well, and by April the operators were well-trained and achieving excellent results," Wiltsche says. "Within three months, the mill was able to produce 872 tonnes in a 24-hour cycle – quite impressive!"

The surface properties of the folded boxboard are significantly improved now – mostly due to the enhanced formation of the new top ply. This allows operators to reduce the grammage of this most expensive ply, resulting in reduced raw material costs.

The compact design of the ANDRITZ PrimeFlow SW headbox makes it easy



The surface properties of BM 1's folded boxboard are significantly improved after the ANDRITZ rebuild – mostly due to the enhanced formation of the new top ply.

to install, which is important for rebuilds. The key components – a step diffuser and nozzle with lamellas – generate microturbulences in order to obtain the best possible formation and evenness. Precision manufacturing and the structural rigidity of the headbox ensure excellent basis weight cross profiles. More than 30 such headboxes have been sold by ANDRITZ to date. This headbox, in combination with the *PrimeForm* forming section, play an important role in achieving excellent quality.

Says Francesco Canal, “The board’s surface is better than before, so we have an improvement in quality. We are working without the undertop layer, so we are able to save money in raw materials. Plus, the reeling up of the sheet is much better now.”

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PAPER AND BOARD EXPERT CLUB

We had the opportunity to speak with Mill Director Francesco Canal and members of the ANDRITZ project team during the 2011 meeting of ANDRITZ's Paper and Board Expert Club (PABEC), held this year in the Styrian region of Austria. Joining in the discussion from the ANDRITZ team were Georg-Michael Sautter, Director of Sales, Mario Bernasconi, Senior Sales Manager for paper and board machines, and Mario Wiltsche, Product Manager for headboxes.

PABEC focuses on ANDRITZ's latest paper/board solutions, offering customers the opportunity to join ANDRITZ experts in discussing product features, functionality, and design. The latest results from mill applications are shared. Several guest speakers give interesting inside views.

(Left to right): Mario Wiltsche, ANDRITZ Product Manager for headboxes; Georg-Michael Sautter, ANDRITZ Director of Sales for paper and board machines; Francesco Canal of Reno de Medici; Mario Bernasconi, ANDRITZ Senior Sales Manager for paper and board machines, and Klaus Peternel, journalist. ▼



▲ The surface properties of the folded boxboard are significantly improved, thanks to the new top ply. Operators can now reduce the grammage of this ply, resulting in lower raw material costs.



Discovering the spirit of Eldorado

Scan a list of pulp projects and you come across familiar names – Suzano, CMPC, Arauco, Stora Enso, Veracel, Fibria, Jari, Eldorado Eldorado? Who or what is Eldorado? We traveled to Brazil in search of Eldorado. No, we didn't find the legendary Lost City¹, but we did find a team of people who are making history – and blazing a new trail in the traditional market pulp sector.



"In the food business, we focus every single day on costs, quality, and yield. The focus is the same in the pulping industry."
Rogério Peres, CEO

"We bought the best available technologies, so there is no risk with that. The challenge is that everything is the biggest in the world."

Carlos Monteiro,
Industrial and Technical Director

*"I came for the challenge."
"It's a new challenge."
"I think it's very challenging."
"The challenge of starting up the world's biggest line."*

In separate interviews with Carlos, Guilherme, Paulo, Pasquale, Marcelo, Luciana, and Fabio, you hear remarkably similar responses to the question, "What brings you to Eldorado?"

This tells you something about the people who are managing a new company building a new pulp mill near Três Lagoas (Mato Grosso do Sul), Brazil. People who are energized by creating something. People who, although veterans, still have youthful enthusiasm about breaking new ground in a traditional, conventional industry.

With one investment, Eldorado Brasil will start up the world's largest pulp production line in 2012 (1.5 million t/a). This will propel the company from zero to becoming the fifth largest producer of bleached hardwood pulp in the world. Even more incredible, the location has the potential of supporting three identical lines in

parallel – 4.5 to 5 million tonnes of pulp per year from one site!

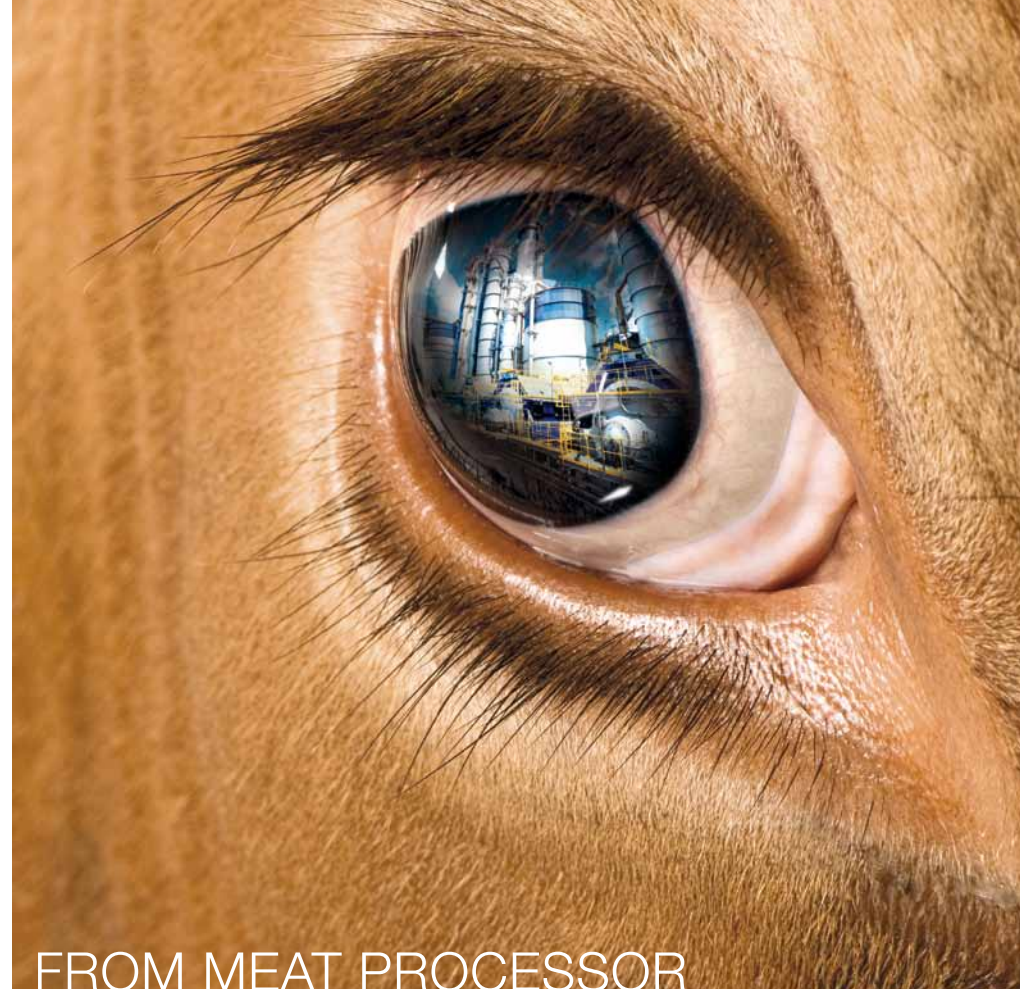
Eldorado was given birth by the most unlikely of midwives – people who made their fortunes processing animal protein. Maybe there is some karmic harmony in having the world's largest animal protein processor build the world's largest pulping line?

This is not lost on Rogério Peres, CEO of the new company. "The company is new, the mill is new, and I am new to the industry," he says. "I can see how an outsider might scratch his head and wonder about our sanity."

There has to be a connection here somewhere

Rogério works for J&F Holdings, the major equity holder in Eldorado. Chances are, you have never heard of J&F, but you probably have heard of some of the brands it owns. Spearheaded by José Batista Sobrinho, who in 1953 started a small meatpacking plant (capacity five head of cattle per day), J&F owns JBS, the world's largest processor of animal proteins. Sobrinho's three sons have built a global company with annual revenue of 30 billion USD.

"J&F's growth is based on opportunities from the animal protein business," says Rogério. The opportunity that inspired Eldorado came from forestry. A shareholder and good friend of the Batista family owned a forestry company which supplied wood



FROM MEAT PROCESSOR TO PULP PROCESSOR

"Our owners may not know the technology, but they know business. Our job is to convince them they made a wise investment."

Marcelo de Carvalho, Production Manager



¹ El Dorado, Spanish for "the golden one," became the legendary "Lost City of Gold" that has fascinated treasure seekers. In pursuit of the legend, Francisco Orellana and Gonzalo Pizarro departed from Quito in 1541 in a disastrous expedition towards the Amazon basin. Orellana became the first person to navigate the Amazon all the way to its mouth, but he never found gold.



◀ Michael Schögl (left) and Günther Leitner, ANDRITZ project managers for the pulp drying plant, review project details as the massive fiberline is being built in the background. The drying plant will house two ANDRITZ 6.7 m drying machines.

for the power boilers at JBS' meat processing plants. The Batistas were invited to take an equity position and eventually purchased majority control of the forest operations, Florestal Brasil.

"J&F saw the potential to expand this business to value-added producers like pulp mills," Rogério says. "We saw that the new pulp projects were frozen during the economic crisis and the ones under construction were looking at 2013-2014 start-ups. If we could do something quickly, we had a window of opportunity. We had land and we had wood, so we went looking for financing. A major lift came when Brazil's national bank (BNDES) put up 2.7 billion Reals (1.7 billion USD). Now it became a question of how best to build a pulp production facility, since that is not our expertise."

People with connections

The first employee hired was Carlos

Monteiro, Industrial and Technical Director. Monteiro is well-known in the Brazilian pulp industry. He has probably lost count of how many projects he has been involved in during his 30-year career. This will be his third greenfield mill.

On top of experience, Monteiro has a long list of contacts in the industry. A few phone calls later, he found key people who were willing to leave good-paying jobs at other mills to work with him to build this new company from scratch. For example, Guilherme Araujo, who is Mill Manager.

Araujo has the experience of Aracruz (Fiberline C), Veracel, and Fibria (Horizonte) to his credit. It was a "no brainer" for Guilherme to join Eldorado, he says. "Not blind faith by any means, but a deep respect for what Carlos and Eldorado planned to do."



▲ Pasquale Neto, Eldorado General Project Manager for Recovery and Utilities.

The next level was a bit more challenging. "My biggest challenge was to reassure people that this company and this project would go ahead," Guilherme says. "This is a 'real' greenfield. In other projects I've worked on, we always had the support of the back office who handled matters like infrastructure, how to receive chemicals and fiber, how to interface with the forestry guys, and so on. Here, we did not have a back office – we had to create one!"

Still, with little fanfare and lots of connections, Eldorado assembled a "dream team" of about 40 of Brazil's elite – people who know exactly what it takes to execute a greenfield project. By Monteiro's calculations, this team has 1,000 years of collective experience.

Among the first to sign up were Paulo Netto and Pasquale Neto, General Project Managers for Fiberline and Recovery/Power, respectively. Both of these gentle-



"This is a real greenfield. New company, new mill. We did not have a back office to support us – we had to create one."
Guilherme Araujo, Mill Manager

men have about 30 years' experience in project work, including the recent Fibria Horizonte project.

"Every day is a challenge," they say, "and every day brings different conditions. It's in our blood to do these big projects – that is how we stay energized." Pasquale points out that the last pulp company that started from zero in Brazil was Aracruz 30 years ago. "We are the modern day Aracruz," he says.

"We have a very small group to oversee this project," Paulo says. "We are relying very much on the expertise of the EPC contractors, like ANDRITZ."

For the Eldorado project, ANDRITZ is delivering the fiberline and white liquor plant. This includes a three-line woodyard, the digester, washing, screening, a DD-Washer based bleach plant, and the two-machine pulp dry-

ing plant (with automated baling lines). The white liquor plant includes recausticizing and the largest lime kiln in South America.

In addition, ANDRITZ will deliver the IDEAS simulator and web-based training tools. Araujo has used the simulator before and calls it, "a great benefit for fast start-ups." However, unlike other projects where the simulator seems to "collect dust" after the start-up, Guilherme says this time, "we are assigning one person full-time to keep the simulation up-to-date so the training and re-training we do will be more effective after the mill is running."

"It is good to work with ANDRITZ again," Netto says. "I was responsible for the fiberline project at Horizonte, and I'm working again with many of the same people. That was a great project, and we had a great team."



"Every day is a new situation. It's in my blood to do these large projects."

Paulo Netto, Eldorado General Project Manager for Fiberline

The largest digester in the world. ANDRITZ's Gustavo Guastti, Materials Coordinator (left); Rafael Batistela, Fiberline Erection Manager (center); and Silas Navarro, Fiberline Mechanical Supervisor are standing on the foundation of the 5,100 adm/d ANDRITZ continuous digester. ▼



A mixture of youth and experience

This is the first greenfield project for Fabio Nakano, the Maintenance Manager at Eldorado. With 30 years of experience, Fabio knows how to maintain a mill, but this is his opportunity to design a better system up front. "We are quite busy defining and purchasing spare parts, inputting all our procedures into the SAP system, and hiring and training staff," he says. "We have to be fully ready before the equipment is commissioned. It is very exciting."

Training is being done in partnership with SENAI, a government-sponsored institution that develops a wide range of industrial training programs. Local students can choose one of two paths: pulp production or maintenance.

"The students are 17, 18, and 19 years old, younger than we normally would select," Fabio says. "We plan to fill about 40% of our operator and maintenance positions with these new hires and 60% with experienced people from other Brazilian mills."



"I CAME FOR THE CHALLENGE"

A special breed of people has joined the Eldorado management team – highly experienced, but energized by the challenge of building something completely new. Guilherme Araujo, Mill Manager, is flanked by his team. (Left to right): Fabio Nakano (Maintenance), Paulo Netto (Projects), Luciana Bortoluci (Technical Control), Araujo, Pasquale Neto (Projects), and Marcelo de Carvalho (Production).

Under control

Luciana Bortoluci, a chemical engineer, is Manager of Technical Control. She was a process engineer at VCP before moving to Monsanto. "I'm happy to be back in the pulp and paper industry," she says.

Luciana is responsible for process engineering and the laboratory. "We are setting up the lab to perform all the pulp testing, quality control, and analytical procedures," she explains. "We are in the process of hiring and training people now." She is also responsible to coordinate the process engineering consulting in three primary areas: fiberline, recovery boiler, and drying machine. "And, I have overall responsibility for the production information management system, which will house all the process information that production and maintenance managers need."

Streamlined production management

After 22 years in the pulp and paper industry, Marcello de Carvalho was eager for a challenge. Starting up the world's largest pulp mill and being responsible for total production filled the bill perfectly.

"Normally, mills have someone responsible for the fiber side, and someone else responsible for recovery and utilities," Marcello explains. "We have all process areas reporting to one person. Each of the five teams (woodyard, fiberline, drying, recovery, and utilities) will have technical advisors to assist the operators."

Marcello's team is preparing the procedures for commissioning and start-up and is looking forward to the day that chips first flow to the massive digester. "Our owners may not know the technology, but they know business," he says. "Our job is to convince them they made a wise investment."

Better education. Better community.

Social Sustainability as practiced by Eldorado is more than empty words in an annual report. The company is reaching out to the local communities without intruding and in surprisingly quiet ways. "It's not about getting Eldorado's name out there," says Michele Dantas, Communications Coordinator at the mill. "This is our home, too."

Celso Sartori, Director of Communications, cites some of the areas that Eldorado is working on "behind the scenes" as he puts it. There are projects combatting child abuse, improving the schools, and supporting local programs that are far removed

from the business of making pulp. "We focus on creating a good reputation in Três Lagoas first, and then the outside world," Celso says. "This is one of the largest private investments in Brazil. By March next year, we will have close to 8,000 workers in the area. The relationship we have with the communities is very important to us."

Halfway there

Monteiro is pleased with the project's progress. "We are on-schedule and about 50% complete," he says. "We bought the best technology for the fiberline and are not at all concerned. All the technology is proven, but the challenge is that everything is the biggest in the world."

"On November 15, 2012 when this mill starts up, we will be well-positioned in the market," Peres the CEO says. "Our people are committed and focused. Our technology will give us a quick start-up and good efficiencies. Our arrangements with the chemicals suppliers and our fiber supply will give us a good cost structure. The markets in Asia, North America, and Europe will be impressed with our quality. We can't control the price of pulp, but we can and will control our costs. The spirit of Eldorado will be alive and respected."

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▲ Working in partnership with SENAI, a government-sponsored training institution, Eldorado is training young people (17-19 year olds) to become future operators and maintenance people at the mill. This class is studying the basics of cellulose production.



Always OPPortunities to improve

Studies show that about 80% of the loops in a typical control system are poorly tuned. Quite often, processes run better in manual mode than automatic. This is not at all what mills expect when they invest in a control system. We visited two mills – one pulp and one paper – to learn how a new service called OPP is helping them restore the profit potential of automated control.

The problem with loops

The basis for all process control is the control loop – the act of taking a measurement, comparing it to the desired target, making adjustments as necessary, then taking a new measurement to see the effect of the adjustment. Things would be quite simple if there was just one loop in a paper mill – but there are hundreds.

A control loop repeats itself over and over and functions well until something "breaks" (a sensor loses calibration, a transmitter fails, etc.). Then the loop needs to be "tuned" again. Not only must each loop be tuned, but also the interactions between the hundreds of control loops must be coordinated. *This is not a simple job.*

ANDRITZ's service for managing these control loops is called OPP (Optimization of Process Performance). OPP combines sophisticated software with expert human knowledge. OPP software collects information from a distributed control system (DCS) about each loop, control valve, motor, and variable in the process. Sophisticated statistical tools identify loops that are not performing well and predict the economic impact on the process. Then ANDRITZ experts work with the mill to develop strategies to optimize the process. The main advantage of OPP is that it looks at a process as a whole – and not just a single control loop.

"We want clear, measurable projects to increase production, increase availability, and save chemicals. The OPP service helps us do just that."

Jorge Reyes, Santa Fe's Fiber Line Superintendent, at the cutter/layboy, where lost time was reduced by 50%.

PULPING EFFICIENCY AT SANTA FE

"We are just a couple of months into this OPP service," says Jorge Reyes, Fiber Line Superintendent at CMPC Celulosa's mill in Santa Fe, Chile, "but we are already seeing good results. What fascinates me is that we are doing this without capital investments."

Reyes had visited several mills in Brazil, where OPP got its start as the brainchild of Sindus ANDRITZ, and learned about the potential. In July, he signed a contract for the service at his home mill in Santa Fe.

Santa Fe Line 2 was designed to produce 780,000 t/a, and after a shutdown in late 2011, is being upgraded to produce 1,126,000 t/a.





▲ In the pulp drying plant are (left to right) Alvaro Oportus, Process Engineer; Jorge Reyes; Leonel Masias, DCS Machine Operator (seated); Manuel Marchant, ANDRITZ OPP Analyst (seated); and Leonel Sanchez, DCS Machine Operator. OPP has reduced downtime in the drying line by 50%.



Patricio Muñoz, Bleach Plant Operator, checks instrumentation. Start-up sequencing has been dramatically reduced, resulting in more tonnage through the bleach plant. ▶

As a starting point, Reyes and his team had identified some areas where there were too many variations and the production was not as stable as they would like. But, lacking the ability to easily collect and analyze the process data, they were “flying blind” according to Reyes.

Enter Daniel Schuck and Manuel Marchant from ANDRITZ Maintenance Solutions. Schuck is the Global Product Manager for OPP and Marchant is the local OPP Analyst who used to work at the Santa Fe mill. After the OPP software was installed, the first two to three weeks were spent with the OPP team collecting data from the Foxboro DCS and analyzing where the opportunities might be.

“The OPP software helps us rank certain priority variables like chemical and energy consumption, levels, and flows, depending on the process we are looking at,” says Schuck. “So the data we collected confirmed the feelings that CMPC had about certain processes and also uncovered some other opportunities.”

Working together, ANDRITZ and CMPC identified the projects with the highest priorities and set to work. “We are very pragmatic here,” Reyes says. “We want clear, measurable projects to increase production, increase availability, and save chemicals.”

Opportunity #1 – Increasing uptime of drying machine

Problem: The mill was losing about 60 minutes per day production from the cutter/layboy due to moisture variations in the pulp dryer.

Solution: OPP analysis showed that recirculation of broke caused problems in the cutter and the baling line. The OPP team developed a moisture control strategy based on % broke, machine speed, steam production, and conditions in the dryer.

Result: Reduced downtime by 50%. Some shifts have no lost time. This results in an increase in production.

Opportunity #2 – Reducing start-up time in bleach plant

Problem: Whenever there was a shut-

down in the line, the time to ramp-up the bleach plant from 0 to 3,000 t/d took from 8-12 hours. At 12 hours, production from the digester would have to be reduced. Operators were manually controlling the ramp-up (levels, temperature, etc.). Being conservative, they would adjust and wait, adjust and wait.

Solution: The OPP team studied the process response and developed an automatic starting sequence that was faster than operator intervention. Operators can push one button and the ramp-up is smooth and controlled.

Result: Start-up time reduced to 10-20 minutes. A full ramp-up to 3,000 t/d now takes 2-3 hours. This results in increased production.

Opportunity #3 – Reducing alkali variations in the digester

Problem: Increased production in the digester led to wide variations in the chip feeding the alkali charge on the chips. This resulted in pulp quality variations and less stable production at high levels.

Solution: Based on alkali measurements and analysis of the data collected, the OPP team developed an improved control strategy for levels in the impregnation tower and precise alkali dosing to match production.

Result: More effective utilization of white liquor. Stable feeding and impregnation of chips – even at the highest levels of production. This amounts to increased production from the digester.

Learn as we go

“One thing I learned quickly is that you can’t view the OPP service as just an automation project,” Reyes admits. “You must involve the operators from the very beginning.”

He cites the example of the CMPC/OPP team congratulating itself on the elegant solution to increasing drying machine uptime (moisture control and broke tower control). Yet when they came in each morning, they would find that there was

downtime during the night shift. “The operators were turning the control off at night,” Reyes says. “No one had asked their input and no one had explained the benefits of the new control. They turned it off because they thought they could run it better the old way.”

Next?

“As I mentioned, we are only in the baby steps with OPP,” Reyes says. “We’ve got a list of priority projects coming up. Implementing a diagnostic module for the drying machine, reducing ClO₂ consumption in the bleach plant, and stabilizing flows to the DD Washers are next in line.

“Any process has variations. We find it easier now with the OPP service to analyze the control loops, tune them better, and in some cases invent new control strategies. There are lots of opportunities, and now it is easier to find solutions.”



▲ Manuel Marchant, ANDRITZ OPP Analyst, in front of an OPP workstation. OPP software analyzes control loops and process data from the mill’s DCS.

PAPER PRODUCTIVITY AT PIRACICABA

The Oji Papéis Especiais Ltda. (Oji Specialty Papers) mill in Piracicaba, São Paulo State, Brazil was recently sold by Fibria to Oji of Japan. Oji and Fibria had a long-standing relationship since 1989 when Oji began providing technical assistance.

In fact, the first impression after passing through the security gate at the Piracicaba mill is the touch of Japan in the courtyard. Large bamboo plants, a small waterfall, and a small pond of water offer a place for employees to sit outside. Everything is quite serene.

The mill produces about 160,000 t/a of heat-sensitive, self-copying, and couche papers, making Oji the largest manufacturer of heat-sensitive paper (used for fiscal receipts, cinema and theatre tickets, airline tickets, barcode labels, etc.) in South America. The company recently launched

◀ Increased production in the digester led to wide variations in the chip feeding and alkali charges. The OPP service developed an improved control strategy leading to more effective alkali dosing, stable feeding in the DiamondBack chip bin (left) and stable impregnation of chips (top left) – even at the highest levels of production.

a new paper developed in Piracicaba (Termoscript KPR) which contain fibers that react to UV light and retain the recorded information for up to seven years.

“We first heard of the OPP service during an internal meeting,” says Alessandro Frias, Automation Project Consultant for Oji. “ANDRITZ gave a presentation on the system and the results they were achieving at Fibria’s Aracruz mill. Our immediate impression is that we could use this service in Piracicaba.”

There were two things that Anderson Meca, R&D Coordinator at Piracicaba, liked about OPP. “One is that it is a team effort,” he says. “It involves both ANDRITZ and us working together to set targets and priorities. The second is that we can see results quickly, without capital investments. These projects take two months or less each to complete.”

Frias also notes a third benefit. “Our Director is not interested in knowing which control technique was used, but what the results are in terms of economic return for the company. We can show him easily.”

Meca, Frias, and their colleague Sérgio Budeiz (who is now Coating Production Coordinator but was then part of the team as Paper Machine Coordinator) decided



▲ Piracicaba's Pulping Lab Analyst, Marcelo Tognim, performs a lab test for ash content. Manual laboratory inputs are used by the control strategy developed by the OPP service to predict the mineral load and automatically compensate for it when an operator changes production rates or alters the ash-to-fiber ratio.

that a good visual demonstration for the Director would be the refiner control strategy created based on OPP data. Previously, the refiners were manually controlled and variations were common.

"We were in manual mode when we brought him into the control room," they recall. "Then we turned the control back on. Within five minutes, he could see the refiners stabilize and the energy consumption drop. No long discussions about control techniques for stabilizing SR values. He could see the results, including a 5.2% savings in net refiner power consumption. That is real money!"

Other OPP projects have included control of freshwater tank levels (where level variations have been reduced by a factor of 33 and the actuation of the control valve has been reduced by a factor of 59), control of tank levels for the refiners (where level variations have been reduced by a factor of 69), level control for the paper machine

chest (where variability has been reduced by a factor of 58), and ash content control.

Working to the limits

The challenge for every papermaker is to control the mineral load. It was a big problem for Piracicaba, according to Budeiz, due to the broke handling system. "We purchase pulp here and want to maximize the amount of ash to keep our costs as low as possible," he says. "But obviously there is a limit to the amount of ash we can add before affecting the performance of the web on the machine. The amount of broke we were returning to the sheet added mineral content, but we weren't sure how much. Sheet breaks were frequent."

Using the OPP software to collect data from the DCS, ANDRITZ experts modeled the process to understand the root cause of the ash control problem (the return of broke) and developed a control strategy to predict the mineral load and automati-



cally compensate for it when an operator changed production rates or altered the ash-to-fiber ratio.

Gustavo Michel, Software Development Supervisor for ANDRITZ Maintenance Solutions, explains: "The goal is always to work close to the limits without exceeding them. Operators tend to work on the safe side to avoid sheet breaks or other disturbances. At Oji, they were substituting fiber for ash because they were not sure how far they could go. OPP not only showed them what the limits were, but also gave them a way to automatically control it."

"What is impressive to me is that we run without an online ash analyzer," says Meca. "The OPP guys developed a control strategy so that we could continue to use our manual laboratory inputs. Not one dollar of capital was required – we just used the data we already had in a more beneficial way."

"Within five minutes, we could see the refiners stabilize and the energy consumption drop."

Anderson Meca, R&D Coordinator

Alessandro Frias, Automation Project Consultant (left), Anderson Meca (center), and Sérgio Budeiz, Paper Machine Coordinator. ▶

Now, when an operator wants to change the ratio of ash-to-fiber, or change the production rate, it is automatically controlled by the OPP-developed control. The results have been quite astounding to Piracicaba. There has been a significant reduction in the variation of mineral loads. Tighter control allows operators to run much closer to the upper ash content limits and still keep the sheet within specifications. The Piracicaba mill has been able to add 2% more ash to its sheet (which means a 2% reduction in purchased pulp). At a savings of 16 USD per tonne (240 t/d production), the economic results are quite impressive.

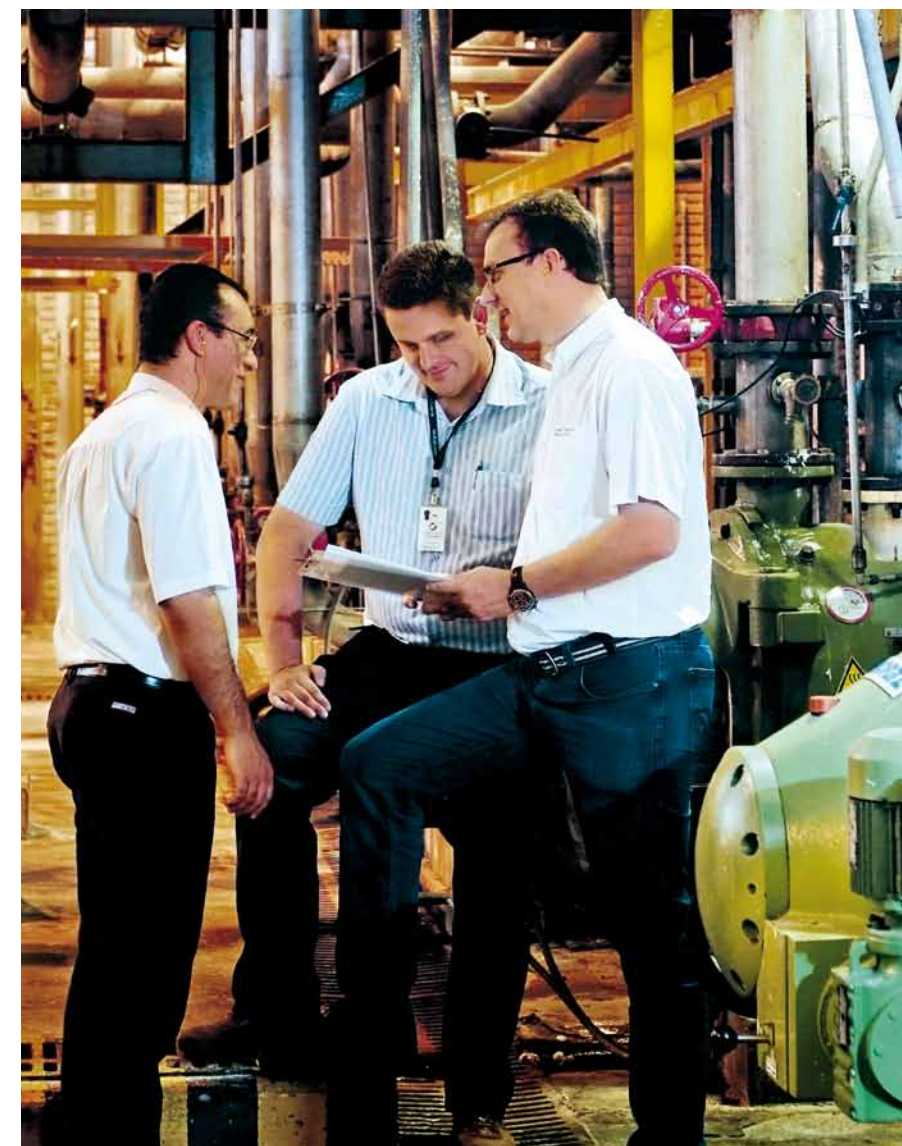
"Our results show that it is possible to optimize processes using our existing equipment without capital investments," Frias says.

The team from Oji Papéis Especiais presented the results of their success with OPP at the Brazilian annual conference (ABTCP). Their technical paper and presentation received an award for being the best at the Technical Session of Automation and Process Control. The team was happy because this was the first time their new owners were represented at the Congress.

Equally important, their Director and owner are happy with the financial results of process optimization the OPP way. Frias and Meca have a longer list of opportunities to tackle in the coming year.

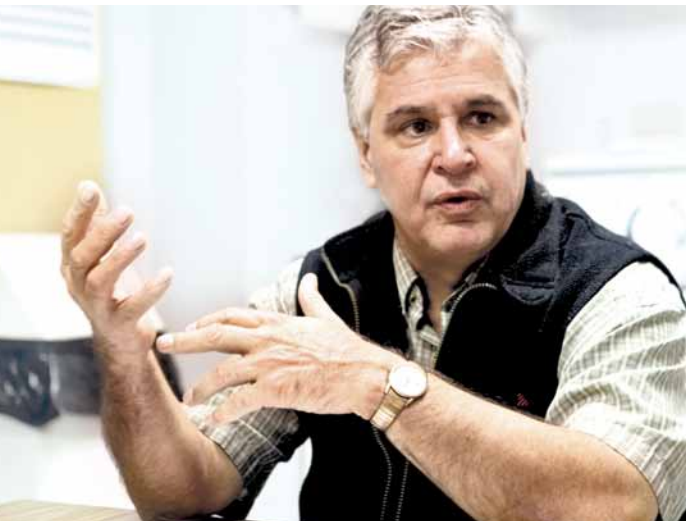
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The Piracicaba team working on the OPP optimization projects includes (left to right): Sérgio Budeiz, Paper Machine Coordinator, Pedro Sarco, Automation Electronic Technician, Alessandro Frias, Automation Project Consultant, Paulo Batista, Assistant Maintenance Technician, Anderson Meca, R&D Coordinator, José Rasera, Manager Maintenance Engineering and Utilities, and Fernando Simone, Production Manager. ▼



A Catalyst for creativity

The Crofton mill of Catalyst Paper gets its share of visitors. Not because it is located on picturesque Vancouver Island in British Columbia, but because it has managed to consistently improve in terms of production and efficiency – and make creative use of existing equipment. ANDRITZ is a working partner in Crofton's transformation – delivering technology, services, refiner plates, and upgrades through a close multi-year relationship. The results are impressive.



"We had to come up with more tonnes someplace. Adding DIP and kraft was not the answer."

Bob Reilly
Operations Specialist,
Catalyst Paper

Depending on the time of year, it can be very difficult to focus on anything but the natural beauty of Vancouver Island. Situated off the western coast of Canada, 80 km from the mainland, this island graciously receives thousands of ecotourists each year. The views, the drives, the forests, the accommodations, the food, the wines are all stunning. So, with a choice of hiking or kayaking or producing TMP, it is remarkable to this visitor that so many competent professionals at Catalyst Paper choose the latter.

Catalyst people are clearly focused and energized. Working in one of the hardest hit sectors in papermaking (newsprint and directory), the management and employees are highly motivated to restore profitability. Lacking a large capital budget, they use ingenuity and experience instead. This includes the ingenuity and experience of supplier/partners to provide needed expertise. This is the story of the ANDRITZ partnership at the Catalyst Crofton mill.

Catalyst for peak performance

Located on southern Vancouver Island, Crofton is an integrated pulp and paper mill. Major products include newsprint, directory paper, and kraft pulp. It began operation as a kraft mill and today has two paper machines and two pulp machines with an annual capacity of 739,000 tonnes. About 430,000 t/a are mechanical grades.

Bob Reilly is a 38-year veteran of Crofton. He has seen it all – through good times and bad. Today, as an Operations Specialist, he works to continually fine-tune the TMP plant: three lines of primary and secondary refiners and three reject refiners using hemlock.

The first mechanical pulp was refiner mechanical pulp (RMP). "The RMP plant was built in the 1960's," Reilly says. "It was the predecessor to TMP with four Bauer (today ANDRITZ) Model 480 DD counter-rotating refiners installed in series. These

were high consistency atmospheric refiners using cold chips. A conveyor system was used to move the pulp between refining stages."

The original TMP system was installed by ANDRITZ (Sprout-Waldron) in the early 1980's. "Each line had a Twin 50 pressurized primary refiner and a Twin 45 atmospheric secondary refiner," he says. "In 1988, we added a third line and also upgraded the Twin 45's to Twin 48's."

Production of the TMP plant was about 545 t/d. "There was not much pressure on TMP because we were also using stone groundwood (SGW), RMP, DIP recycle, and kraft in the furnish," Reilly says.

But in 1999, Crofton shut down its SGW mill. Next to follow was the RMP plant (primarily to improve fiber quality). In 2000, the mill added three ANDRITZ TwinFlo 52/58 refiners for third-stage low consistency mainline refining. "Adding the terters (tertiary refiners) gave us about 10-15% more production," recalls Randy Pellerin, Maintenance Supervisor, a 20-year veteran of the mill. "We also found a lot of issues with how the lines were running and made several adjustments to improve reliability. We were finally running in the 97%+ availability range."

"We had to come up with more tonnes someplace to supply all three paper machines," Reilly says.

Adding expensive DIP and kraft to the furnish was not the answer, so Crofton focused a very interesting project – its own brand on advanced TMP refining.



▲ The Crofton mill has three TMP lines equipped with ANDRITZ refiners. Production now approaches 900 adt/d.

"When we do rebuilds with ANDRITZ, they come back run-tested and with the plates on. All we have to do is add power to the refiner and that's it."

Randy Pellerin, Maintenance Supervisor

Randy Pellerin (left) with TMP Operator Nick Smith. ▶

"Crofton ATMP"

A word of explanation: ANDRITZ has a branded process for TMP production called ATMP (Advanced TMP) encompassing several patented technologies for reducing energy consumption while improving fiber characteristics of softwood species (you can read about ATMP in *Spectrum No. 23*).

The Crofton approach is completely different (series reject refining), but in an internal contest within Crofton, the winning name for their process was Advanced TMP. "Ours was years before ANDRITZ, so ours is better," Reilly jokes. "Seriously, though, there may be a time when we can adopt some of the modules of ANDRITZ ATMP here that potentially would deliver gains in efficiency."

The idea on series reject refining came about when Reilly and Pellerin went to a PAPTAC meeting in Toronto and heard a





◀ Crofton modified a mothballed RMP into a series rejects refining plant – freeing up the mainline refiners and giving the paper machine operators a high-strength furnish to blend into its newsprint and directory grades.

“ANDRITZ adds intellectual properties and upgraded components into every rebuild. They don’t just machine metal.”

Pat Cooper,
Manager of Mechanical Pulp

presentation from a mill in the southern USA. “That mill was running 100% pine,” Reilly recalls, “and they could get production, but could not get quality. Their solution was to put in another reject refiner.”

A TMP operator once made the offhand remark that even though the RMP plant made poor quality pulp, it would make a great reject plant. “This got us to thinking,” Reilly says. “Inside the idled RMP plant was a complete system: refiners, screens, cleaners, thickeners, etc.” Reilly and Pellerin looked at each other and asked, “Why not?”

They modified the mothballed RMP plant (mainly the feed system) into a rejects refining plant. The results were quite good. “The paper machines loved it,” Reilly says. “And we were able to increase the mainline refiner freeness, which increased our production rate. This allowed us to export the excess rejects to feed our ATMP plant.”

The pulp goes to its own stock chest, rather than being sent back to the TMP line. “It is basically a furnish unto itself,” Reilly says, “blended with TMP at the machine chest to replace kraft. The operators add it to give the right tensile strength for the sheet being produced. That is why we can make a 29 gram sheet with very little kraft in it compared to anyone else.”

Today, TMP production is up over 900 adt/d and “has actually exceeded 1,000 tonnes some days,” Reilly says. “I



can see several small adjustments we can make to be at 1,000 adt/d consistently.”

Rebuilding a rebuild strategy

There was a time when Crofton was doing its rebuilds with a local shop. With limited crane capacity, the shop would do the work in sections, and Crofton personnel would assemble the equipment at the mill. “This was quite labor intensive on our part,” Pellerin says.

Pat Cooper, Crofton’s Manager of Mechanical Pulp, moved over to the department from the mill’s kraft line. “I got here in 2005 just as they were finishing the capital project which included a new ANDRITZ refiner,” he says.

The Paper Mill Manager at the time paid Cooper a visit and said, “TMP needs to increase its reliability and production rate. I see ANDRITZ’s name on the equipment. Why aren’t you working with them to find solutions?”

The answer, unfortunately, was one of service and communications. “Their rebuild shop back then was in the eastern USA and the communications was not

good,” Pellerin says. Today, ANDRITZ is doing all the rebuild work for Crofton from its Brantford, Ontario (Canada) facility.

Larry Nemeth, ANDRITZ’s Manager of Upgrades for Canada, recalls a couple of crucial meetings with Crofton. “First, we had to prove to them that we had changed,” Nemeth says. “Then, we had to show that we were not only capable of doing rebuild work, but we could be responsive and also add value. We had to earn their trust again.”

“We started working more closely with ANDRITZ,” Cooper says. “Then in February 2006, we hit record daily and monthly production records and have been improving ever since.”

Nemeth adds, “The first couple of refiners, they sent a person to our shop to inspect the units and discuss the rebuild options. Now we do it by telephone and email. The trust is back.”

“We challenged ANDRITZ to get us to a five-year rebuild interval instead of the 36 months when I came here,” Cooper says. “We rely on them to tell us the correct in-

terval based on what they find when they tear the refiner down. We’re now hitting the five-year mark.

“Perhaps we can get it cheaper locally, but then all we get is machining and parts. We won’t get the intellectual property, upgraded parts, experience, and level of service that we get with ANDRITZ.”

“Plus, when we get our rebuilds done now, they come back already tested and with plates on,” Pellerin adds. “All we have to do is put the power to it. That’s it.”

Plates for performance

“ANDRITZ helps us with reliability (rebuilds) and performance (refiner plates),” Cooper says. “We not only have refiners that run reliably for the full-term, but also we’ve seen improvements in vibration levels, fiber quality, and the stability of production due to the plates.”

“Whenever you optimize one place, you create an opportunity someplace else,” Reilly says. “For example, Warren Howe, ANDRITZ’s Senior Service Technician, was a huge help to us in optimizing our lines – finding lost power, reducing plate clashes, and tweaking our permissives and automated sequences, etc. The improved per-

formance increased the backflow steam in our secondaries to the point where the plates could not handle it.”

Norm Webster, District Sales Manager for ANDRITZ, worked with Catalyst to find the best plate design. “The first trials were with the open-design plates from the primaries on the secondaries,” Webster says. “They saw immediately they were on the right path as the open design reduced the backflow steam. Loading was good. Vibration and acceleration dropped. By improving the steam handling characteristics of the refiner, through proper plate application, stability improved.”

Then Luc Gingras, Vice President of TMP refiner plates for ANDRITZ, helped optimize further with the latest plate patterns. “We are running a trial now with the open-design FiberMaxX pattern on the primaries and a combination of DuraMaxX and FiberMaxX on the secondaries,” Gingras says. “It is early in the trial, but the initial results are promising.”

Reilly is impressed with the performance of the DuraMaxX plate, which they are using in other refiners at the mill. “This plate has been nothing short of outstanding for us,” he says. “The refiner is no longer fight-



▲ Norm Webster (left), ANDRITZ’s District Sales Manager, discusses plate performance with TMP Operator Sherman Power.

ing back-flow steam and there has been a significant reduction in plate clash events. The load variations in the load sense conveyor have dropped by 30%. We have not plugged or kicked out a load sense conveyor since we installed the plates. And, we are getting 1,900 hours between changeouts. The line runs like a clock at full load.”

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(Left to right): Larry Nemeth (ANDRITZ), Bob Reilly (Crofton), Norm Webster (ANDRITZ), and ATMP Operator Mark Noonan in the Crofton control room. ▼



Building a sustainable project

Dear Readers: Regular readers of Spectrum know that our articles are usually written after a project starts up. However, Montes del Plata of Uruguay is giving us a rare opportunity to publish a series of articles as this greenfield mill is being built. We thank Montes del Plata for allowing us to journey with them as they plan, build, commission, and start-up a world-class 1.3 million t/a market pulp mill.

Dispatch #2: Conchillas, Uruguay

The scene is a series of project trailers at the mill site near the small village of Conchillas, Uruguay – the “nerve center” for the project teams of Montes del Plata mill construction site.

Okay, not everything has gone smoothly so far (there have been some permitting delays, labor disruptions which have now been settled, and project management changes), but Montes del Plata is focused on the future. “There were some rough spots, but these are behind us now,” says Richard Turner, Project Director. “We are intent on moving forward. We have our target in sight.”

At first glance, many of the items on the project’s “to do” list seem to have little to do with building and starting up a pulp mill: Extend the highway. Complete the houses. Move equipment into the canteen. Schedule monthly community meeting. Check bus schedules.

“Sustainability comes in many forms,” explains Erwin Kaufmann, CEO of Montes del Plata. “Yes, we want to have a sustainable mill for years to come. To do that, we first need to have a sustainable project.”

Carolina Moreira, Communications and Public Relations Manager, articulates the challenges that her company is overcoming to ensure a sustainable project. “Providing the best standards for workers is critical to our success,” she says. “By the time construction is over, we will have served six million meals and housed 6,000 people. We will have built a new 12 km highway to bypass the village of Conchillas. We will have initiated programs for local entrepreneurs to profit from our presence in the area. And, we will have involved the communities every step of the way.”

Putting things in perspective

“Keep in mind, this is not a country with an infrastructure to support the pulp industry, like Finland or Sweden or Brazil,” says Turner. “We are creating as we go, helping local businesses adapt to our requirements, training people, etc. Pulp mills – especially very large greenfield ones – are a little out of the ordinary here. In addition, unemployment here is very low. We are competing for labor.”

First: A place to live

At the height of construction (around July 2012), 6,000 workers will occupy the mill site each day. About 30% of the workforce is local to the Colonia area. The others come from farther away and need a place to stay. Hotels and private houses are not sufficient, so Montes del Plata is becoming adept at building housing.

Pablo Cabot, Infrastructure Construction Coordinator, is amazingly calm and upbeat for a man up to his eyelashes in housing and road construction projects. Cabot is supervising the construction teams building both barracks-style and individual housing in Colonia and the town of Carmelo (about 60 km from the mill site). “The individual homes have three bedrooms, a common seating area, and a small kitchen,” Cabot says. “We are also building a community building for entertainment and dining at each site.”

The lodging center will accommodate 80 people in each building. In total, 1,500 people can be housed in the lodging center and an additional 1,000 in the individual homes, according to Cabot. Some private housing and hotels will also be utilized.



“Uruguay does not have the same infrastructure supporting the pulp industry like Nordic countries or Brazil. Pulp mills – especially very large greenfield ones – are a little out of the ordinary. We are creating as we go here.”

Montes del Plata’s Richard Turner, Project Director

Civil construction crews pour foundations for recausticizing tanks in the white liquor plant. ▼



Sustainability comes in many forms:

Communications. Montes del Plata produces a weekly televised report for the local communities around the mill. Here, one of the project engineers for the white liquor plant is being interviewed. ▶



Housing. At the height of construction, 6,000 workers will be on-site each day. About 30% of the workforce is local and the others require housing. The company is building barracks and individual housing for workers in Colonia and Carmelo. Here, new furniture is being moved into an individual home. ▶



Food. Imagine serving 6,000 hot lunches a day on-site. Menu planning, procurement, preparation, and clean-up take on gargantuan proportions when thought of in this way. ▶



Highways. A highway extension is being constructed around the village of Conchillas. By bypassing mill traffic around the village, the historic heritage and lifestyle of the people will be preserved. ▼

What happens to the housing when the project is completed? “We are donating the housing to the local governments for the local people,” Cabot says. At 40,000 US dollars per house, that is a rather generous donation by Montes del Plata.

An army marches on its stomach

Napoleon said it well, “An army marches on its stomach.” The mill’s “army” is the 3,000 civil construction workers now on-site. For this army, food is the fuel that keeps them going. Hot meals are prepared in Carmelo (45 km away) and transported to the site canteen. Soon, the canteen will be fully equipped for food preparation (including what will be Uruguay’s largest oven, according to José Pedro Diaz, Montes del Plata’s Communications Coordinator for the Colonia region).





It is a steady flow of people through the lines. “Can you imagine serving 6,000 hot lunches a day?” Diaz asks out loud. Menu planning, procurement, preparation, and clean-up take on gargantuan proportions when thought of in this way.

Marching is optional

The army of workers is transported by bus to and from the mill site each day to minimize the amount of traffic on the surrounding roads. A fleet of air-conditioned coaches picks up workers at their housing each morning and takes them back each evening.

Building success – one day at a time

ANDRITZ is the main technology supplier with a scope covering the woodyard, fiber-line, pulp drying/baling plant, chemical recovery block, white liquor plant, and power island (biomass and auxiliary boilers).

ANDRITZ is committed to hiring as many Uruguayans as possible, according to Hannu Ronkonharju, Project Director. “We are subcontracting civil and mechanical construction to Teyma and Saceem of Uruguay,” he says. “Other local suppliers will be employed to move all the machinery containers from the port in Montevideo to Punta Pereira.”

The construction site leader for ANDRITZ is Pekka Salomaa. He is a veteran of global projects, including the Fray Bentos (UPM greenfield mill) project in Uruguay. He arrived on-site in August. Salomaa is well-briefed on the discussions leading up to signing the contract with Montes del Plata. “It is important to know the options that were discussed during the sales phase,” he says, “so we have a good understanding of the customer’s needs and why each alternative was chosen.”

“No matter what the challenges, we all have a job to do. At the end of the day, we have to build it right, and it has to run well.”

Pekka Salomaa, ANDRITZ Site Construction Director

Pekka Salomaa (right) with Paavo Tornainen, ANDRITZ Director of Subcontracting, in the white liquor plant area.



“Selecting and training people for our production team is the highest priority right now. We just finished recruiting the first 20 engineers.”

Héctor Araneda,
Montes del Plata Mill Manager

ANDRITZ is subcontracting civil and mechanical construction to Teyma and Saceem of Uruguay. Other local suppliers will be employed to move all the machinery containers from the port in Montevideo to Punta Pereira. Here, workers pour concrete for a foundation. ▼



Every project has its challenges. “This project has a mixture of people from various companies and cultures,” Ronkonharju says. “One-half the ownership is from Finland and one-half from Chile. The main subcontractors are from Uruguay. We all have different working methods. We have to talk on a daily basis and be sensitive to the fact that each partner’s work impacts the others.”

“No matter what the challenges, we all have a job to do,” Salomaa says. “At the end of the day, we have to build it right, and it has to run well.”

On the critical path now is the completion of the port terminal at the mill site. The port will not only receive wood and send pulp to market, but is needed to bring in the equipment from ANDRITZ and other suppliers. Salomaa estimates that the largest piece from ANDRITZ will be the steam drum for the recovery boiler – which is about 200 tonnes – which will be shipped from Finland.

Preparing for operations

Héctor Araneda, Mill Manager, is doing another kind of building at the site – his team

“We will donate all the housing we build to the government agencies after the project is completed. This will provide homes for lots of local people.”

Pablo Cabot,
Infrastructure Construction Coordinator,
Montes del Plata

Workers putting the finishing touches on the individual homes Montes del Plata is building for workers. The individual homes will house 1,000 people. ►



of technicians, engineers, and support people who will operate the mill. Araneda, a Chilean, started working with the project in late 2009 during the feasibility study.

“We recruited the first 20 engineers who will work in production, maintenance, engineering, environmental, and administration,” Araneda says. “These new engineers are in Finland for comprehensive training. Early next year, we begin training for operators and technicians. We will use the IDEAS dynamic simulator for training. After that, we will send the operators for on-the-job training at different mills in Chile and Brazil.”



Dredging equipment is at work to deepen the port at the mill site so it can accommodate the incoming and outgoing ships. The port will not only receive wood and send pulp to market, but is needed to bring in the equipment from ANDRITZ and other suppliers. ▶



“The transition from construction to the operating phase is very critical. Community engagement through regular monthly meetings is critical to supporting long-term social sustainability.”

Andrea Storace, Social Responsibility Coordinator



Araneda's team will total about 170, plus the maintenance staff. ANDRITZ Maintenance Solutions will provide complete maintenance for the mill. The contract period is for 8.5 years. “I was deeply involved in this decision and I think we have a good contract,” Araneda says. “Based on what ANDRITZ has done in other projects, my expectations are quite high.”

Five years out

Andrea Storace has a longer time horizon than most of the people we met at Montes del Plata. As Social Responsibility Coordinator, she has projects that keep her busy now – but her focus is on the longer term.

“Life here is very dynamic now,” she says, “but what happens when the excitement of the construction wears off?” Storace and her colleagues are working with communities to create a five-year outlook ... what should be done today to sustain the positives from the mill and avoid the negatives.

“We made studies in 2010,” Storace says, “to have a good baseline analysis of the social, economic, and cultural situation here. Then we have monthly meetings with community leaders to monitor the situation.”

The community engagement program that Storace is coordinating is active on five fronts: road safety, health, business development, development of local workers, and the highway extension project.

“The highway extension project is a good example of the care we are taking to make sure people are listened to and taken care of,” Andrea relates. “The bypass will preserve the historic heritage and lifestyle for the people of the village of Conchillas.”

To construct the highway, two families had to be relocated: an 81 year-old couple and a family with two teenage children. Storace and her team talked with the families to address their concerns. Full financial compensation was made for the relocation as well as all the arrangements with utilities, moving companies, etc. In both cases, homes were found nearby to preserve the family and social network of the relocated people.

“Teaching local businesses and interested entrepreneurs about business basics, and helping to develop these local suppliers (food preparation, domestic services, housing services) to support our operations is very exciting,” Andrea says. “They have many opportunities which will translate to a sustainable and vibrant local economy.”

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Safe and sound

Celulosa Arauco is embarking on a strident program to be world-class in every respect. Key indicators measuring safety and environmental compliance are constantly monitored. The program is not only for mill personnel, but also for suppliers to the company. Those suppliers who do not make the grade will be excluded – those who are up to the task, including ANDRITZ Chile, are seeing additional work and responsibility.

Like many companies doing business internationally, Celulosa Arauco not only benchmarks its performance among its six pulp mills (3.21 million t/a production), but also against similar mills around the world.

It was not that many years ago that pulp mill performance was primarily measured in terms of production and quality. But the measurements have radically changed: people first, environment next, and then production.

Reliability Plan for competitiveness

Based on the concept of Reliability, Arauco has published its plan to reach world-class competitiveness in all three areas: safety, environment, and production. The plan calls for forming “strategic alliances” with suppliers and key business partners in a mutual spirit of cooperation to achieve these business objectives, according to Rodrigo Robles, Manager, Woodyard Operations in the Nueva Aldea mill's woodyard operations.

“We do not compromise the safety of our personnel,” Robles says. “Our people are the most valuable resource of our company.”

Robles came to the Fiber department from being an Environmental Engineer at the mill. “Since the start-up of this mill in 2006, Nueva Aldea has always been under close government and public scrutiny,” he explains. “Stringent regulations were placed on the mill from the beginning and closely monitoring our environmental performance is very normal for us. The renewed emphasis on worker safety is now something we take very seriously.”

Nueva Aldea has two fiberlines – one for hardwood, one for softwood. The woodyard and white liquor plant were delivered by ANDRITZ as part of the greenfield start-up. The woodyard consists of three chipping lines (700 m³/hr capacity). One is for pine and the other two for eucalyptus.

ANDRITZ Chile is a designated Service Company for Arauco at the Nueva Aldea and Valdivia mills. A contract chipper service agreement (HQ-Plus) is in force for all three lines at Nueva Aldea and two lines in Valdivia.

Since the start-up, ANDRITZ Chile has been responsible for routine maintenance of the HQ-Chippers, including providing a contract service (HQ-Plus) for chipper knife replacement. The working relationship and level of cooperation with

“This emphasis on worker and supplier safety is something we take very seriously.”

Rodrigo Robles,
Manager, Woodyard Operations



▲ ANDRITZ was the largest shutdown contractor for Arauco's 31-day shutdown of the woodyard to support the Nueva Aldea mill's capacity expansion to more than one million tonnes of pulp per year.

ANDRITZ has always been excellent, according to Robles.

“With the advent of their Reliability Plan, we wanted to take our relationship with Arauco to the next level,” says Dale Love, Product Manager in South America and Workshop Manager for ANDRITZ's facility in Concepción, Chile. “To do this, we had to make sure that our procedures relating to safety, environmental compliance, and quality were aligned with those required by Arauco.”

A major shutdown is the first test

The ANDRITZ person responsible for ensuring that the on-site technical and safety procedures are in place is Johan Alegria, Wood Processing Field Service Specialist. The first big test of ANDRITZ's compliance would be a 31-day shutdown of the woodyard, which began in August. The shutdown was extra long due to work that had to be done to support the mill's capacity



▲ Rodrigo Robles of Arauco (left), Dale Love of ANDRITZ (center), and Luis Burdiles of Arauco in the wood processing plant at Nueva Aldea.

expansion project (increasing to more than one million tonnes per year).

“We made it very clear from the beginning that it was not enough for the machinery to be working properly,” Robles says. “The work had to be done safely.”

Alegria knew that Arauco would be conducting daily audits of each supplier’s safety and environmental standards. “This was not a big obstacle for us at ANDRITZ,” he says, “because as a global supplier we have no tolerance for poor performance when it comes to safety. The challenge was to make sure all our contract workers understood the procedures and followed them to the letter.”

Love adds, “You can have the best policies and procedures on paper, but that only works if every worker has the right attitude. Each person is responsible for his/her own safety and the safety of those nearby. That requires training, supervision, and reinforcement on a daily basis.”

Luis Burdiles, Mechanical Maintenance Coordinator for Nueva Aldea’s woodyard

and water treatment plant, was recently transferred from another area of the mill. “I had to learn new equipment and new processes,” he says. “The people at ANDRITZ were very helpful to me during the shutdown. I was involved in the planning and scheduling where everything looks good on paper. But the actual shutdown work in the field went surprisingly well.”

ANDRITZ was the largest shutdown contractor for the woodyard and had a “full plate” of work, according to Love. “I was pleased to see how independent that ANDRITZ could work,” Burdiles says. “If they encountered a problem, they solved it. This required minimal supervision from our side and made our job easier.”

Even with a full workload, ANDRITZ pitched in when another supplier could not do the work on schedule. Routine maintenance of a bark shredder revealed the need for a rotor changeout. The Concepción workshop took on the additional work, working overtime, and completed the job in four days. “The good suppliers who have the competence get additional work,” Burdiles smiles.

CONCEPCIÓN SERVICE CENTER

Concepción is the second largest city in Chile, located on the Bío-Bío River on the Pacific coast, about 500 km south of Santiago. The ANDRITZ offices and service center in Concepción is the contact point for Chilean customers for service activities. The center supports replacement parts sales, field services, technical assistance, engineered wear products, light assembly, and rebuilds for pulp mills, paper mills, and MDF plants. With the establishment of this center in 2004, ANDRITZ has strengthened its ability to serve the growing market in Chile and to provide local contact points with Chilean customers.

(Left to right): Cristian Villarroel, Workshop Foreman; Harri Soila, General Manager; Macarena Ulloa, Safety Specialist; Pedro Fernandez, Mechanical Technician; Julieta Contreras, Production & Logistics Control Specialist; and Dale Love, Wood Processing Product Manager (South America) and Workshop Manager. They are standing in front of a new 10-knife chipper disc being assembled for delivery in Chile. ▶



Great expectations

“What we expect of every supplier is that they plan their work carefully, have the right tools and people on-site when needed, keep their areas clean, work safely, avoid doing anything that might cause an environmental incident, and that they monitor themselves to avoid rework,” says Robles. “That’s not asking too much, but it does require discipline.”

The “discipline” that Robles refers to extends to each individual worker on site. Arauco has “5 Key Rules” that every worker must know and follow (e.g. when to use a safety harness, procedures for lockout/tagout and enclosed spaces, etc.). Any violation results in immediate removal from the site and the inability to work at any Arauco site in the future.

Grade A

In the first annual evaluation after implementing the Reliability Plan, Arauco classified ANDRITZ as “Grade A” with very good performance. The requirements in all areas were met, some beyond expectations, without direct supervision from Arauco supervisors.

“It has been my observation that safety problems mostly occur when the work is routine,” Robles says. “I have a high level of confidence that ANDRITZ shares this view and will continue to be a world-class partner. Our discussions are always open. Their people want to solve problems, not point fingers.”

FIND OUT MORE AT
www.spectrum.andritz.com



“I was pleased how independently ANDRITZ could work. If there was a problem, they solved it.”

Luis Burdiles, Mechanical Maintenance Coordinator



▲ Pressurized refining system for MDF producer Hebei Kaiyue Wen An County Tianjua Density Board. This is the first unit totally manufactured in the ANDRITZ China workshop.



ANDRITZ CHINA MANUFACTURES FIRST PRESSURIZED REFINING SYSTEM FOR MDF PRODUCTION

ANDRITZ is a clear market leader in China for pressurized refining systems used in the production of medium density fiberboard (MDF) with 122 systems sold. However, the installation of a 54"-1CP refiner at Hebei Kaiyue Wen An County Tianjua Density Board Co., Ltd. (Hebei, China) is of special note: it is the first totally manufactured in the ANDRITZ China workshop in Foshan.

The first fiber from the system, which has a design capacity of 440 t/d, was produced in August 2011. In total, the Hebei Kaiyue Group placed orders for four pressurized refining systems from ANDRITZ within the last year.

ANDRITZ's Chinese operations (ANDRITZ Technologies Ltd.) were established in 2002. What started as a small pump manufacturing operation is today bringing state-of-the-art technologies to China, and providing service to the large customer base there. At the end of 2010, ANDRITZ employed 1,300 people in China.

ANDRITZ began manufacturing equipment for the panelboard industry in China in 2008. With this ability to manufacture with European quality in China, the time and cost of overseas transport and transactions can be conducted in local currency. To date, 22 systems have been ordered from ANDRITZ Technologies Ltd. in China.



TAKE THE E-LINE TO SAVINGS

ANDRITZ Kufferath introduces a new line of forming fabrics that deliver quite remarkable results – up to 30% savings in energy consumption compared to standard fabrics.

Known as the E-Line of fabrics, the technology uses newly developed yarns to reduce the friction between the fabric's roll side and the top side of the dewatering elements. This results in decreased drive loads in the wire section.

Any of ANDRITZ Kufferath's fabric designs can be manufactured with E-Line yarns. There are no limits to paper grades and no machine adjustments required when switching from a standard fabric to E-Line technology.

DELTA FACILITY STRENGTHENS SERVICE IN WESTERN USA AND CANADA

ANDRITZ PULP & PAPER acquired the assets of Tristar Industries Ltd., a high-quality rebuild and manufacturing facility in Delta, British Columbia, Canada. The facility is now operating as the Delta Service Centre. With high transportation costs for West Coast customers to ship equipment back to ANDRITZ's service center in Alabama, the company has been looking for a facility in the Pacific Northwest. The experienced employees, reputation, and location of the former Tristar operation made it an ideal acquisition.

The Delta Service Centre rebuilds equipment for such systems as continuous digesters (including M&D digesters), pressure and vacuum washers, twin roll presses, thick stock pumps, and recausticizing filters. In addition, ANDRITZ has developed several new technologies for vacuum washers that can now be manufactured at the Delta facility. Tristar also had excellent capabilities to perform thick stock pump rebuilds and this expertise is also being shared with our Pell City Service Center.

M&D is a trademark of ANDRITZ

The ANDRITZ center in Delta, BC, Canada, gives customers in the western USA and Canada local access to high-quality rebuild and manufacturing services. ▼



Highlights of

COMPLETE LINES

Stora Enso
Skoghall, Sweden
New woodroom: PowerFeed infeed conveyor with deicing, Waplans debarking drum, two HHQ-Chippers, new ANDRITZ bark crusher

Confidential customer
Virginia, USA
New BFB biomass boiler (incl. feed and ash systems)

PVO Kaukaan Voima
Lappeenranta, Finland
Biomass handling system

Sun Paper Paper Industry Joint Stock
Yanzhou, Shandong, China
EPS delivery of lime kiln

Daio Paper Mishima
Shikoku City, Ehime Prefecture, Japan
Cooking modernization incl. TurboFeed system

E.ON Climate & Renewables
Blackburn Meadows/Sheffield, UK
New BFB biomass boiler, dry flue gas cleaning system and auxiliaries
Thermal utilization of recycled waste wood as a CO₂-neutral energy source

Stora Enso Narew Spolka z o.o.
Ostroleka, Poland
OCC line incl. rejects treatment
First complete OCC line in Europe based on latest ANDRITZ technology

LLC Pulp Invest
Kazan, Russia
PrimeLineCOMPACT tissue machine and stock preparation system
First PrimeLineCOMPACT in Russia

NEW ORDERS

COMPLETE LINES

JSC Kamenskaya BKF
St. Kuvshinovo, Russia
Rebuild and extension of relocated machine: Wire section, PrimePress X shoe press, PrimeDry dryers, PrimeRun web stabilizers, and PrimeFeeder tail threading system

KEY EQUIPMENT, UPGRADES, AND MODERNIZATIONS

Celulose Arauco
Constitución, Chile
New HHQ-Chipper with feeding line

Zellstoff- und Papierfabrik Rosenthal
Rosenthal, Germany
Modernization of recovery boiler and recausticizing plant

Ilim Group
Kotlas, Russia
Recovery boiler rebuild and new debarking drum with special steam deicing

UPM Kymmene
Kymi, Finland
New O₂ delignification system with DD Washer, knot separation and screening modernization

Soporcel Pulp
Figueira da Foz, Portugal
New evaporation train and modernization of existing plant

Stora Enso
Oulu, Finland
Bale press

Sappi Southern Africa
Ngodwana, South Africa
Rebuild pulp drying line

KEY EQUIPMENT, UPGRADES, AND MODERNIZATIONS

Fibria
Três Lagoas, Brazil
Bale transportation system

Xinxiang Xinyu Group
Xinxiang, Xinya, China
Modernization of used BCTMP plant relocated from Canada to achieve state-of-the-art P-RC APMP technology

SCA
Ortviden, Sweden
Three screw presses for TMP extraction washing

UPM Kymmene
Kaipola, Finland
LC refiner

SCA Hygiene Products
Pernitz, Austria
Equipment for dewatering, dispersing, and bleaching

Anhui China Tobacco Recon Tobacco Science & Technology
Bengbu, Anhui, China
PrimeDry Steel Yankee (5,486 mm diameter)

Doh-Ei Paper
Hokkaido, Japan
PrimeDry Steel Yankee (3,658 mm diameter)

Cartiere del Polesine
Polesine, Italy
PrimeFlow TW headbox

Sappi Kraft
Ngodwana, South Africa
PrimeRoll HV Smart calender, PrimePress X shoe press

Highlights of

COMPLETE LINES

Zhanjiang Chenming Pulp & Paper
Zhanjiang, Guangdong, China
Key equipment for greenfield pulp mill: woodyard, fiberline, pulp drying, chemical recovery (evaporation, recovery boiler, and white liquor plant)

Domsjö Fabriker
Örnsköldsvik, Sweden
Debarking and chipping line (incl. Waplans debarking drum and HHQ-Chipper)

SCA Östrand
Sundsvall, Sweden
LimeKiln and LimeDry for new line and LimeWhite for existing line
New kiln is 100% fueled by wood dust

Packaging Corporation of America
Valdosta, GA, USA
New recovery boiler

Nippon Paper, Gotsu Mill
Gotsu, Japan
Fluff pulp drying line

NEW START-UPS

COMPLETE LINES

APP Gold East Paper
Zhenjiang, Jiangsu, China
750 t/d P-RC APMP system
Start-up one month ahead of schedule

Fushun Mining Group (Hupo Paper TM1)
Fushun, Liaoning, China
PrimeLineTM W8 tissue machine

KEY EQUIPMENT, UPGRADES, AND MODERNIZATIONS

PT-Tanjungenim Lestari Pulp and Paper
Musi, Indonesia
Wood handling upgrade (RotaBarker and HHQ-Chipper) and fiberline upgrade

Twin Rivers Paper Company
Edmundston, Canada
ANDRITZ Wash Press AWP

Packaging Corporation of America
Counce, TN, USA
Recovery boiler rebuild

KEY EQUIPMENT, UPGRADES, AND MODERNIZATIONS

CMPC
Santa Fe, Chile
Recovery boiler rebuild

SCA Hygiene Products UK Limited
Prudhoe, Great Britain
SpeedWasher and sludge treatment equipment

Reno de Medici
Ovaro, Italy
Rebuild of press section
PrimePress X shoe press

SCA Tissue
Menasha, WI, USA
PrimeFlow 2-layer headbox

Cham Paper Group
Condino, Italy
PrimeWinder Ortho

Have box. Will travel. Innovative service for disc filters.



The ANDRITZ PULP & PAPER Disc Filter Service Box was created with a simple idea in mind. Instead of shipping sectors and bags out for replacement – we come to you. Our Service Box is a compact workshop with all the equipment required for replacing disc fil-

ter bags and repairing damaged sectors. It is staffed with experts who inspect your filters, renew the filter bags, and make on-site repairs to the sectors if needed. All we need from you is a place to set up, water, and electricity. We will be there when your shutdown is planned. The

Disc Filter Service Box saves you valuable time and money. Plus, you get the benefit of higher filter performance and safe operations.

For further information, please contact: pulppaper-service@andritz.com