

# SPECTRUM

NO. 19 / 1-2009

MAGAZINE OF PULP & PAPER 



## **ROARING TIGER**

Wu Jialing, Chairman, Hunan Tiger Forest & Paper Group, China (Page 4)

## **MOVING AND REMOVING**

Unique service solves Norske Skogindustrier's problem in Norway (Page 14)

## **AHEAD OF THE CURVE**

SCA starts up new tissue machine in the USA (Page 18)

## **BOARD STIFF**

CTMP adds value to Klabin's board products in Brazil (Page 22)

**ANDRITZ**  
Pulp & Paper

# CONTENTS

## 3 MANAGEMENT MESSAGE

## 4 ROAR OF THE TIGER



## 10 RAISING THE ROOF



## 14 MOVING AND REMOVING



## 18 AHEAD OF THE CURVE



## 22 BOARD STIFF



## 28 BEST CHIPS?



## 32 STICKY SITUATION



## 34 "BIG ONE" STARTS UP



## 38 NEWS FROM THE WORLD OF ANDRITZ

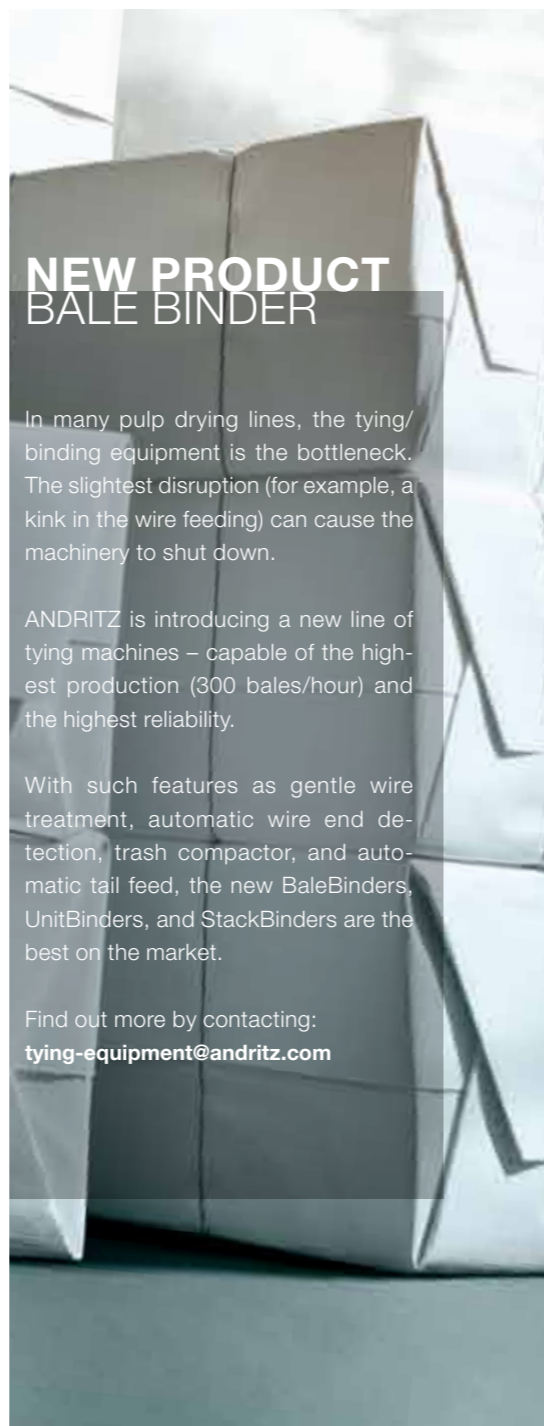
## NEW PRODUCT BALE BINDER

In many pulp drying lines, the tying/binding equipment is the bottleneck. The slightest disruption (for example, a kink in the wire feeding) can cause the machinery to shut down.

ANDRITZ is introducing a new line of tying machines – capable of the highest production (300 bales/hour) and the highest reliability.

With such features as gentle wire treatment, automatic wire end detection, trash compactor, and automatic tail feed, the new BaleBinders, UnitBinders, and StackBinders are the best on the market.

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## Are we there yet?

### Economies go down; economies go up.

Everyone is asking the same questions: Have we reached the bottom? Will we know the bottom when we see it?

How well-prepared is your company for the next up-cycle? The answer to that depends upon your strategy during the current down period:

**Restrain.** Operational efficiency and cost cutting are baseline for survival. Carried to the extreme, this means "hunkering down and waiting it out." The success of this strategy depends upon your competitors, as lots of companies increase market share by offering lower costs and higher service during a recession.

**Redeploy.** "It makes sense to do research and development counter-cyclically," says Tom Nicholas, associate professor in the Entrepreneurial Management Group of

Harvard Business School. "Recessions can be really useful strategic opportunities."

Many companies use the downtime to shut down unproductive machines or mills, move assets to different locations, rebuild machinery, change grades to meet future demands and, in general, get aligned for the next up-cycle.

Planning and executing a rebuild (deciding what to keep, what to upgrade, and what to replace) requires expertise and experience. We at ANDRITZ have that experience and offer complete services for optimizing lines, debottlenecking mills, relocating equipment, and modernizing equipment.

**Reinvent.** Existing companies can make incredible gains during a recession. According to experts, these gains come when companies are motivated to solve an important problem and benefit the world.

What is the next important problem to solve in our industry: is it in packaging, or communications, or hygiene, or perhaps energy? Within our own company, we are making large R&D investments in energy (especially biomass-to-energy and biomass-to-liquid processes). Energy is a huge cost for mills, yet it also has the potential to generate significant revenues for chemical pulp mills. Our recent installation of a BioPower boiler for Ence in Spain gives testament to the potential.

Will your company be the one to exploit counter-cyclical thinking to redeploy or reinvent itself to profit from the next up-cycle? If so, we stand ready to be your technology partner.

Or if you are purely in survival mode, we have some non-capital solutions that will help you as well.

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# The Roar of the Tiger in Hunan

Contrary to most parts of China, Hunan Province has an abundance of forest resources that are virtually untouched. A greenfield kraft pulp mill supplied by ANDRITZ is regarded as “truly positive” – not only from the business point-of-view, but also as a good example of the successful industrialization of China.

According to Wu Jialing, Chairman and Legal Representative of the Hunan Tiger Forest & Paper Group Co., the idea of a pulp mill near Huaihua in Hunan Province originally came from the local government. However, for various reasons, plans were delayed and postponed. “In 2004, our company decided to build a brand new pulp mill in Huaihua, and we got the full support and approval from the local government, coupled with officials from Hunan Province.”

The integration of forest and paper in a greenfield state-owned mill project with the capacity of 400,000 t/a of bleached softwood kraft pulp soon became one of the top

10 symbolic projects of advancing new-type industrialization in the Hunan Province.

The project consisted of the mill, a special railway, and a 140,000 ha forest base: the total investment being close to RMB 4.3 billion (483 million). Since the technology came primarily from ANDRITZ in Europe and a considerable amount of the equipment was manufactured by ANDRITZ in China, Hunan Juntai Pulp & Paper (JTTP) has become a symbol of excellence in the Chinese paper industry in terms of advanced processes, equipment, automation, and environmental protection.

The greenfield 400,000 t/a bleached softwood kraft pulp mill at Huaihua has become a symbol of excellence in the Chinese paper industry in terms of advanced processes, equipment, automation, and environmental protection. ▼



“ANDRITZ was chosen as the strategic partner for the Huaihua pulp mill based on earlier experience, technologically advanced equipment and solid cooperation.”

Wu Jialin, Chairman, Legal Representative of Tiger



“The Huaihua project won the coveted Chinese National Science and Technology Advancement Prize.”

Xu Yuanmei, President Assistant, Chief Director of Huaihua Project, Legal Representative of Hunan Juntai Pulp & Paper



### A new start in a New Year

After the Chinese New Year in 2007, the work was initiated at JTTP. By August 2008, work on China’s largest bleached softwood kraft mill was complete, and production started. “We had to use 400 tonnes of explosives to prepare the new site, which consisted of hills before,” explains Xu Yuanmei, the President Assistant, Chief Director of Huaihua Project and Legal Representative of Hunan Juntai Pulp & Paper.

As always in China, a solid and trusted cooperation between owner and supplier is important. When the main supplier for this huge project was considered, “ANDRITZ was chosen as our strategic partner based on our earlier experience and cooperation,” Wu recalls. This included the full line equipment for an APMP project in Yueyang (the former headquarters of Tiger Group). For ANDRITZ, Tiger was the first customer in China when they entered the market in 1993.

An important element in the selection process was ANDRITZ’s proven capability as a full-line supplier, demonstrated with projects in Brazil and Uruguay. “ANDRITZ has the

expertise to not only provide the process systems, but also all the interconnections between the process islands,” says Tian Hongying of ANDRITZ’s Beijing office.

“During the bidding process, ANDRITZ’s scope of supply was the widest among all the competitors,” says He Ganghui, the Vice Director of the Huaihua Project. “We thought about using different suppliers for different departments, but Chinese mills have encountered difficulties in the past with this approach. ANDRITZ’s experience in supplying whole lines prompted us to select them to ensure consistent technical support and coordination.”

“In Huaihua, we chose the full-line production equipment from ANDRITZ, and this project even won the honor of National Science and Technology Advancement Prize in China,” says Xu Yuanmei.

### Scope of supply

ANDRITZ’s scope of supply comprises the equipment and technologies for wood handling, the fiberline, pulp drying and bale handling, chemical recovery, and white liquor



*“ANDRITZ supplied the most advanced and modernized production line in China.”*

Liu Hongbo, General Manager of Hunan Juntai Pulp & Paper

preparation. The Huaihua woodyard boasts the first horizontally fed HHQ-Chipper™ in China, along with debarking drum, screens, chip storage, and ParaScrew™ reclaimers. The debarking and chipping line is designed for 350 m³ sob/h. The mill's fiber supply is principally softwood (masson pine and fir), but it can also produce bleached hardwood as well.

The fiberline at Huaihua is one of the largest in China consisting of TurboFeed® chip feeding system to a single-vessel Lo-Solids® digester. In total, six DD Washers are employed for washing, oxygen delignification, and ECF bleaching.

The pulp drying and baling line features the stock preparation, twin wire former dewatering machine, airborne sheet dryer, cutter/layboy, and automated baling line. Sheet width at the cutter is 4.2 m.

For chemical recovery processes, ANDRITZ supplied an evaporation plant optimized for energy efficiency (7+ HD effects) with a capacity of 489 t/h and liquor dry solids at 80%. Heat from the hot weak liquor is utilized for

evaporation. The recovery boiler has a capacity of 2200 tds/d and operates at 92 bar and 490° C steam. Within the white liquor plant, Huaihua has the first modern recausticizing plant in China where all solid/liquid separation is performed in filters without a single clarifier. The LimeGreen™ system for green liquor filtration is the first in China. The plant includes a StiroX system for white liquor oxidation.

**Ice storms, collapsing bridges, global economy**

Zhou Kunpeng, Chief Engineer of Hunan Juntai Pulp & Paper, lists three major challenges during the project. The first challenge was an ice storm collapsing the Tuojiang Bridge, which directly affected the transport schedule and caused a two-month delay. Secondly, there was some pressure from the environmental protection aspect: during the test runs, the system was not stable and needed further adjustments. And finally, just as the project was put on-stream, the world met with the global financial crisis and the pulp sheet price diminished having a strong impact on the project reaching its full potential benefits.

The fiberline at Huaihua is one of the largest in China. A total of six DD Washers are employed for washing, oxygen delignification, and ECF bleaching (left). Part of the oxygen stage and bleaching line. Bleached capacity is 1242 admt/d on softwood and 1358 admt/d on hardwood (right). ▼



▲ The mill's fiber supply is principally softwood (masson pine and fir), but it can also produce bleached hardwood as well (above). The Huaihua mill boasts the first horizontally-fed HHQ-Chipper™ in China (upper right). Logs being loaded into the ANDRITZ debarking drum. Capacity for the debarking/chipping line is for 350 m³ sob/h (lower right). ►



“In spite of all difficulties, it took us only 10 effective months of site work to finalize the project,” Xu Yuanmei says. “The first 100 days were for civil work, the second 100 days for installation, and the third 100 days for commissioning and start-up. Our speed was so fast that ANDRITZ project managers could not believe it!”

**Management by standard**

“Under the influence of the financial crisis, the pulp price fell to the lowest point in nearly 20 years,” Zhou Kunpeng says. “Therefore, it was really necessary to make the product ratio, quality, consumption, environmental protection, and equipment operation ratio reach design targets quickly.”

Xu Yuanmei tells that they followed a program named “management by standard,” in which design, construction, and the best international practices were all standardized and included. “Only 90 days after start-up, our softwood production reached an average 1143 t/d, and on one day hit 1320 tonnes,” he says. “By our calculations, even if mill design is 400,000 t/a, we think that reaching 450,000 tonnes will be no foreseeable problem.”

Wu Jialing puts the target even higher. Tiger Group's strategy of today is to reach two million tonnes production per year, and in

the future even three million. “For this target, we are looking forward to developing and expanding our relationship and cooperation with ANDRITZ,” he says.

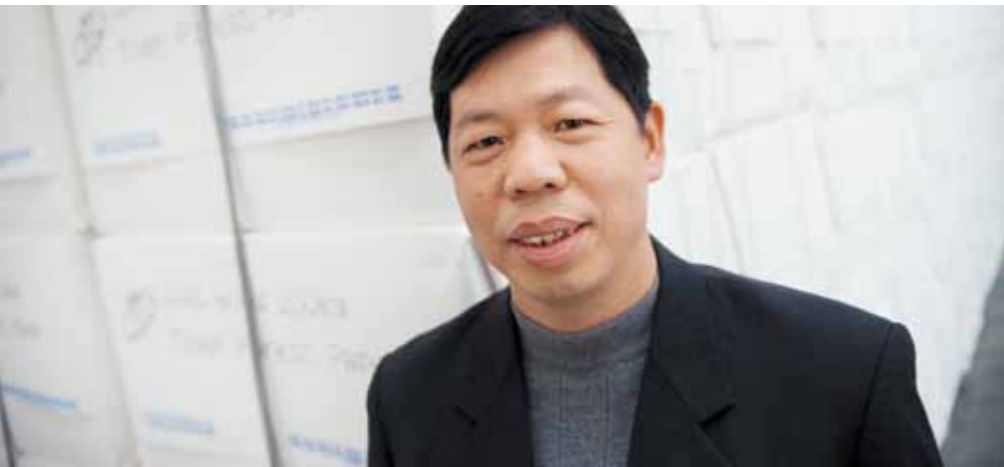
**Best consumption figures in China**

According to Xu Yuanmei, Tiger's pulp quality is very close to the pulp imported from overseas. “We have to compete with them and, therefore, we have an equal quality standard,” he says. “We also have a consumption standard, which includes the consumption of water, energy, power, and various chemicals. At present, our consumption figures are the best in China and our production costs are satisfactory. “The whole system was designed and is running on the most advanced scientific technological equipment available, which is reflected in our management by standards and, therefore, we surpass all local competitors.”

He says that generally speaking, it has been an excellent experience to work with ANDRITZ. “No matter what we do, there is always room for improvement,” Xu Yuanmei explains. “ANDRITZ is a big company. For a project of this size, with technology coming from different countries, different personalities, and different cultural backgrounds, it takes time for everything to efficiently come together.”



▲ Huaihua's recovery boiler has a capacity of 2200 tds/d. The ANDRITZ recovery unit ensures compliance with international standards for emissions.



*“In spite of a major ice storm collapsing the Tuojiang Bridge, we moved with great speed to finalize the project. The aim is to meet all efficiency, quality, and environmental standards continuously.”*

Zhou Kunpeng, Chief Engineer of Hunan Juntai Pulp & Paper

Huaihua has the first modern recausticizing plant in China where all solid/liquid separation is performed in filters without a single clarifier. In the foreground is the lime kiln, with a LimeFire™ burner and a LimeCool™ sector cooler. ▼



**Being a responsible and good corporate citizen**

“For China, there are good opportunities to increase the number of investments and to improve the level of technology in the pulp and paper industry, as the paper consumption per capita in China is still far behind the rest of the world,” says Laura Han, ANDRITZ Huaihua Project Site Office Manager. “That is also the case in technology, compared with the international level, especially in the environmental issues, which are growing in importance.”

“For the Huaihua project, the communications and understanding between a foreign supplier and the local Chinese customer were very critical and crucial issues. I’m sure that with the successful experience of the Huaihua project, Tiger and ANDRITZ will be able to improve on both sides. We are looking forward to further and beneficial co-operation in the pulp and paper field.”

FIND OUT MORE AT [www.spectrum.andritz.com](http://www.spectrum.andritz.com)



*“ANDRITZ’s experience in supplying whole lines prompted us to select them to ensure consistent technical support and coordination.”*

He Ganghui, Vice Director of the Huaihua Project

He Ganghui adds: “Some of ANDRITZ’s departments make very good arrangements, like in the Yueyang deink pulp project, and the pulp drying line here in Huaihua.”

**Key for mutual understanding**

Liu Hongbo, General Manager of Hunan Juntai Pulp & Paper, thinks that also the Chinese could learn from the project. “We should have followed strictly the instructions, suggestions, and advice from ANDRITZ’s supervisors from the beginning,” he says. “It would have helped us move forward more effectively, and could have saved time, efficiency, and additional costs. We realize that good communications and understanding each other are the most important issues due to our different cultural backgrounds.”

The fact is, Liu Hongbo states, that ANDRITZ supplied the most advanced and modernized production line in China, which is now running perfectly. “We hope that we get continuous support from ANDRITZ, especially for the performance tests,” Liu

Hongbo says. “We have 30,000 tonnes of pulp in storage and we hope that it does not take long to earn back the investment.”

According to ANDRITZ Site Manager, Wolfgang Schweinzger, his company lived up to its promise to supply the most advanced and modern equipment, and he noted that Tiger management fulfilled their promise to produce the best quality product and highest performance operating the mill.

“Although for ANDRITZ, the main mission is accomplished, both partners will continue to cooperate in order to ensure and maintain that the mill performs in a way which meets international mill operation standards,” Schweinzger says. “One subject has become clear, based on the successful start-up and operation of the Huaihua mill: we can supply green, energy-efficient, and the most technically advanced mills to Chinese customers, and to customers all over the world.”



The dryness of Huaihua’s market pulp is 90% (which is higher than China’s domestic suppliers). This saves money in transportation and energy costs. Shown at right is the cutter/layboy with cut pulp sheets entering the automated baling line. ▶

A view of the dried pulp sheet as it exits the ANDRITZ pulp dryer and enters the cutter/layboy. ▶



◀ ANDRITZ supplied the complete pulp drying line for this market pulp mill (from stock preparation to automated baling line). Sheet width at the cutter is 4.2 m and production is about 1350 adm/d. Shown is the pulp machine with its twin wire former.



## Raising the roof

Can we completely rebuild and double the capacity of a pulp drying line inside an existing building in the course of four weeks? Not without the help of angels. And, in the case of the Celbi Mill in Portugal, the “angels” were attached to the ends of four very large cranes as they descended through the building’s roof.

“It’s simple,” says João Mota, the Project Director for Celbi’s major expansion, when he scopes out the drying line rebuild project. “Keep the walls of the building and take away everything else.”

Of course, Mota is joking. He knows from his years of experience that there are potential difficulties in cutting off the roof of a building, removing the old equipment, and installing a new line all in the course of one month. “We had to ask ourselves if ANDRITZ could do this,” he says. “But, of course, they had an extremely detailed plan and approach how to do it, and we trusted them.”

### Increased competitiveness

Celbi started in 1967 as a dissolving pulp mill near Leirosa, a small fishing village about 180 km north of Lisbon. Within five years, production was converted to kraft (capacity 120,000 t/a). Over the years, the company changed hands and was most recently sold to the Altri Group in 2006. Altri is a listed Portuguese company with interests in pulp, paper, speciality steel manufacturing, and energy.

“From the moment of the acquisition, the decision was taken to develop this mill,” says F. Silva Gomes, Mill Director and Member of the Board. “The main target is to increase competitiveness. The project basically doubles our capacity from 325,000 to 600,000 t/a. With a total investment cost of EUR 350 million, we will bring our cash cost per tonne to a level among the best in the world.”

“We identified every bottleneck and set about to correct them,” Mota says. “The project includes a retrofit of the fiberline, a total rebuild/upgrade of the drying line, new wood handling line, new chemical recovery,



*“We are very happy with ANDRITZ and the excellent cooperation.”*

F. Silva Gomes, Mill Director and Member of the Board

and a new backpressure turbo-generator.” In parallel with this, EDP Bioelétrica has erected a 30 MW Thermolectric Biomass Plant. This unit generates electricity from 70% bark and 30% other biomass, and represents an additional investment of EUR 75 million.

### A new machine inside an old building

“This was our first full EPC machine rebuild,” says Jürgen Wilding, ANDRITZ’s Project Manager. “Celbi’s goal was to increase drying capacity from about 900-1000 t/d to the level of 1815 t/d.”

The wire width of the new machine is 5250 mm and design speed is 202 m/min. During a speed test performed in March of this year, the line operated at a speed of 205 m/min at the cutter. “The stated design for the line is 540,000 t/a and we already know that we can reach higher levels with this machine,” Mota says.

Yes, the new line looks impressive with its new pressure screens, new headbox, advanced twin wire former, steam blowbox,



▲ In order to meet a tight schedule, ANDRITZ assembled the pulp dryer on a temporary foundation just outside the existing building (top photo). The roof to the building was removed and each dryer module was lifted and placed into position on the new foundation inside the building (bottom photo). In total, 21 lifts were made in less than four days.

shoe press technology, ANDRITZ airborne dryer, new cutter/layboy, new baling line, and rebuild of the existing baling line. But, more impressive is how all this equipment was lifted into and assembled in the old building.

Production at the mill continued at full clip while first-stage installation activities were completed. The target was to dismantle the old machine and install the new equipment during a one-month shutdown in September 2008. In order to meet this schedule, ANDRITZ assembled the ANDRITZ airborne dryer on a temporary foundation just outside the existing building. Erection began in March 2008, according to Peter Sorenby, Site Manager for the dryer installation.

"It's always a challenge when you are mixing old and new equipment," Sorenby says, "and doing the erection work outside in the

weather adds to the challenge. Being near the Atlantic coast, we had some days with high winds, but we managed to erect all the dryer modules in time."

The roof to the building was removed prior to the actual shutdown in order to prepare for the crane lifts. "We ran the old line for 15 days with the roof off the building," says Pedro Baptista, Celbi's Project Manager for the drying line rebuild. "Fortunately, the weather cooperated."

When the mill outage began, crews quickly entered the building to begin the dismantling work. "It was amazing to watch how quickly the old machine was dismantled and removed," Gomes says. "This work was completed in about four days."

Then, the installation work began. "We had four very large cranes in a very small space,"



*"We had to ask ourselves if ANDRITZ could do this. But, of course, they had an extremely detailed plan and we trusted them."*

João Mota, Project Director



*"Our goal was to increase drying capacity from about 900-1000 t/d to 1815 t/d."*

Pedro Baptista, Celbi's Project Manager for the drying line (right) with Jürgen Wilding, ANDRITZ's Project Manager, in front of the pulp drying machine.

Sorenby says. "There were 21 lifts, taking each dryer module from the outside and placing it in position on the permanent foundation. The heaviest lift was 65 t and all lifts were completed in less than four days."

Then it was a matter of putting everything together inside the building, commissioning it, and starting it up. "ANDRITZ has done this work in a very professional way," Mota says. "Everything was well-planned and well-executed."

**EPC Lime Kiln**

Celbi also chose ANDRITZ to provide a lime production line "starting from the lime mud silo to burnt lime storage," according to Jorge Braz, Celbi's Project Manager for the kiln project. The work was performed on a full EPC basis, the first time that ANDRITZ has executed such a contract for a kiln delivery in Europe. "Our intention was to purchase as many packages as possible on an EPC basis because we have a very small team on our side," Braz says.

According to Erkki Osmonsalo, ANDRITZ's Project Manager for the lime kiln, "We provided the detail engineering, the civil works, the buildings, the installation of all the equipment, and the automation as part of this delivery. Mechanical completion was achieved by November 2008 and the plant started up in January 2009."

Celbi's old kiln was supplied by Ahlstrom in the 1960's. "It was originally designed for 100 t/d, but we pushed the operation to 200 t/d," Braz says. "It gave us a good reference in-house for what ANDRITZ could do."

The project was scheduled for 22 months from contract effectiveness to start-up and ANDRITZ met this schedule commitment. "The lime kiln project went very well," says Mota, Celbi's overall Project Director. "It started exactly on time, according to the contract."

Unique to this installation, according to Braz, is that the kiln has two electrostatic

precipitators (ESPs) installed. "That is not common," Braz says. "We want to be sure that we will meet all the environmental regulations even if one of the ESPs is out of order."

"We had a couple of mill stops for the recovery boiler installation that caused us to start and stop," Braz says. "But, after that, the production has been generally stable and good."

**Top quality, room to grow**

The Celbi PP pulp brand is recognized for its quality, particularly its strength, brightness, and porosity. The fiber source (eucalyptus globulus) contributes to this, according to Gomes, and also helps boost the yield. "These characteristics are good for printing and writing grades, laminated decorative papers, and packaging which carries high quality printing," he says.

"We are quite happy and quite proud of the work that has been developed during this project," Gomes says, "and we are very happy with ANDRITZ and the excellent cooperation. We have been able to do very nice work together."

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▲ ANDRITZ also delivered a lime kiln on a full EPC basis (top photo). Jorge Braz, Celbi's Project Manager for the kiln project (bottom photo).

In the foreground is the new ANDRITZ lime kiln. To the right of it is the old Ahlstrom kiln delivered in the 1960's. "It gave us a good reference in-house for what ANDRITZ could do," says Braz. ▼



## Moving (and removing) improves bleaching for NSI

Norske Skog's Saugbrugs mill in Norway has stood the test of time. It marks its 150<sup>th</sup> anniversary this year. Within the last two years, the company has upgraded bleaching systems for its #4 and #5 paper machines with some unique approaches – invented and implemented in cooperation with ANDRITZ.

In this economy, Norske Skogindustrier (NSI) is trying to continuously upgrade its efficiencies without large capital outlays. The upgrades of two bleaching systems for the Saugbrugs Mill are good examples.

The most impressive of the two projects was the removal of a complete bleaching system from the former NSI Union Mill, transporting it to Saugbrugs, and rebuilding it there. ANDRITZ was the service partner for accomplishing this relocation, rebuilding, installation, and start-up of the equipment.

By comparison, the first project (rebuilding the bleaching system for PM4) was easier. The mill's aim was to decrease the chemical oxygen demand (COD) in the effluent and to increase capacity. To meet these requirements, ANDRITZ modified the bleaching tower and increased the tower feeding consistency by upgrading a twin wire press for higher outlet consistency. It was upgraded with a drive roll press nip and new individual drive.

To raise the capacity for future needs, ANDRITZ also upgraded the headbox and floating wedge of a twin wire press used for post-bleach washing (converting from low-consistency to medium-consistency).

*"The rebuild performed by ANDRITZ followed the schedule, started up without problems, and has performed to expectations. The service provided by the ANDRITZ team was perfect!"*

Ben-Johan Gottberg, Senior Project Manager for Saugbrugs (now retired)



In addition, the bleaching chemistry was changed. The result of all this was that less bleaching chemicals were required. This lowered the COD in the effluent being discharged to the Tista River.

The main deliveries from ANDRITZ were a new bottom part of the bleaching tower (for larger volume) and a new MC tower discharge, which allowed for a compact (less space intensive) layout.

### Tight schedule, all promises kept

Delivery of the ANDRITZ equipment started in August 2008. One of the main challenges was the tight schedule: layout, delivery, rebuild and start-up were all conducted within a year. The layout was rather complicated due to the location of the bleaching tower, which was very close to an existing tower.

"Only one additional screw conveyor was needed, and the compact design of the HC/MC tower discharger with the integrated MC pump made it possible to cope with the small space available," says Josef Liendl, ANDRITZ's Sales Manager. "We had several good discussions with NSI before the final concept and layout was fixed. In the end, we were able to put our equipment on a lower elevation, allowing for a larger tower volume."

The solution provided the customer an additional advantage: very little new equipment was needed. The new layout allowed the use of all existing screw conveyors, and the existing HC mixer was already designed for higher capacity.

Another positive: only a short production stop was needed, as most of the bleaching tower erection could be done during normal mill operations.

Ben-Johan Gottberg, Senior Project Manager for Saugbrugs (now retired) is very positive. "The rebuild performed by ANDRITZ followed exactly the agreed schedule," Gottberg says. "The start-up proceeded without problems. The plant has performed to expectations since start-up. We have not had to stop to make correc-



▲ Solid performance. Ben-Johan Gottberg of NSI, Josef Liendl of ANDRITZ, Andreas Kvitvang of NSI, and Rikhard Blomqvist of ANDRITZ relied upon good communications to handle the complex details of the two bleaching projects at Saugbrugs (left to right).

▲ The layout allowed for crane access to place the rebuilt twin wire presses (shown) and to relocate a bleaching tower brought from the nearby Union Mill.



tions. The service provided by the ANDRITZ team was perfect!"

The targets for COD reduction were met and actually exceeded by 30-40%.

The second project involved logistics that were somewhat more complex and delicate, according to Gottberg. The existing bleaching line for PM5 for SC++ grades at Saugbrugs used dithionite only, and could not produce the brightness that the mill desired.

#### Now, move a bleaching tower

The bleaching tower that NSI wanted to rebuild was located at the Union Mill in Skien, on the opposite shore of the Oslofjord. NSI had closed the Union Mill a few years ago. The Union Mill's high-consistency peroxide bleach plant was just what was needed at Saugbrugs.

"The Union Mill's tower had to be dismounted and transported to Saugbrugs. Transport began by truck, then by barge, then back to the narrow roads again. Finally, the five-meter diameter tower had to make it through the narrow entrance between the hill and the mill. Due to the tight fit, each centimeter had to be calculated and perfectly measured," says Ewald Kulhanek, ANDRITZ's Product Manager.

"ANDRITZ did the entire move," says Kjell-Arve Kure, Production Manager at Saugbrugs. "We knew what was going to happen and monitored it from the sidelines, but were not involved. We thought that they might encounter problems with the tight spaces, but none surfaced. All parts of this service promised by ANDRITZ went exactly according to plan."

To make it more interesting, there was very little room at the Saugbrugs site for laydown and installation of the tower and other equipment. "This is to be expected when you do rebuild services in existing mills," Kulhanek says. The equipment included two twin wire presses, whose headboxes were converted from low-consistency to medium-consistency and whose nips were converted from fixed S-Rolls to S-Roll Press Nips. Also moved from Skien were a mixer and three screw conveyors. New equipment from ANDRITZ included three screw conveyors, new vapor hoods for the presses, a new MC discharge system, and the bottom part of the bleaching tower.

"The Union bleach plant had double the capacity we needed at Saugbrugs," says Kure. "Since there were two twin wire presses in parallel at Union, we decided to use one of them upstream of the HC Mixer and bleaching tower, and one of them for post-bleach washing."

#### So far so good

Where to put the equipment? Again, the layout was the most difficult part of the project. "We agreed on a 'close to perfect' layout which allowed crane access to the twin wire presses, and found room for the bleaching tower in the tight space between a building and an unmovable rock facade bordering the mill," says Andreas Kvitvang, Process Manager at Saugbrugs.

ANDRITZ and Saugbrugs had a good and close cooperation during the whole project. Thanks to close communications, necessary corrections were detected early, and rectified accordingly without incident.

During the most hectic periods of commissioning and start-up, brief meetings were scheduled in the morning and late afternoon. Worker safety is a major concern to NSI. "We managed to avoid accidents," Kure notes with satisfaction.

#### A perfect match

PM6 has a peroxide bleach plant built in the 1990's. As the processes for PM5 and PM6 are rather equal, there is a need to use the same quality of pulp, with the same basic brightness level. This is now the case: Saugbrugs can deliver to its customers identical paper quality from both PM5 and PM6 - SCA rotogravure paper of top printability and high brightness.

*"ANDRITZ did the entire move. We thought there might be problems, but none surfaced. All parts of this service promised by ANDRITZ went exactly according to plan."*

Kjell-Arve Kure, Production Manager at Saugbrugs



*"The trend is for mills to purchase and relocate used equipment. Our service teams are experts in relocating, rebuilding, upgrading, and starting up used equipment in a cost-effective way."*

Ewald Kulhanek, ANDRITZ Product Manager

A tight fit. The bleaching tower relocated from the Union Mill for PM5 at Saugbrugs was erected between the building and an unmovable rock wall bordering the mill. ▼



"All three paper machines now have peroxide bleach plants with ANDRITZ presses," Gottberg explains. "The presses are built very solid and sturdy. This gives very high availability, excellent reliability, and very few disturbances due to mechanical failure." And, with similar bleaching on all three machines, "The white water properties are chemically similar," Gottberg says. "This stabilizes production on all the machines."

Rikhard Blomqvist, ANDRITZ's Service Sales Manager, gives full credit to the cooperation between the two partners during the projects: "We have open discussions and a good relationship between NSI and ANDRITZ. The PM4 project was a good foundation for the PM5 project - a natural transition."

He says that even for ANDRITZ, the PM5 project was special, as the bleach plant was moved from another mill and blends existing systems with new equipment. "This shows ANDRITZ's strength," Blomqvist says.

Kulhanek agrees. "The trend is for mills to relocate used equipment from other mills in order to get low-cost solutions," he says. "We bring our expertise in helping customers decide what to relocate, what to rebuild, and what to replace. Quite often, we can upgrade components to produce a system that is state-of-the-art. In addition, we commission and start up the equipment and get everything to work without major problems. In the Saugbrugs case, both bleach plants started well and met the guaranteed values."



▲ Through the roof. The rebuilt bleach tower for PM4 was carefully lifted and lowered through the roof in the bleach plant building.

The new MC discharge equipment and the rebuilt bottom portion of the bleaching tower for PM4. ▼



## Well ahead of the curve in Barton

Starting up in October 2008, the new deink plant and tissue machine in Barton, Alabama are well on their way to full production.

"Perhaps it wasn't as exciting as the greenfield mill in 2004, but it sure feels good to have a successful start-up," says Jim Haeffele, Project Director for the expansion project at SCA Tissue's Barton operations and the company's VP of Tissue Technology.

Haeffele is talking about the new 350 t/d ANDRITZ deink plant and 5.5 m wide ANDRITZ PrimeLine CrescentFormer tissue machine that have added considerably to the capacity and capabilities of the Barton mill. The USD 145 million expansion boosts production capacity at Barton by 70,000 tons to 180,000 t/a.

*"The design is proven, the technology tested, and the ramp-up has been impressive."*

Jim Haeffele, SCA Tissue's Project Director



▲ "With the PrimeLine CrescentFormer, you get a very nice, filled-in sheet for lightweight grades," Jim Haeffele says. Shown above is the new PM 14 – a 5.5 m wide, 2000 m/min ANDRITZ tissue machine.

"The design is proven, the technology tested, and the ramp-up has been impressive," Haeffele says. "Sheet formation is perfect, and product quality is excellent."

Mark Phiscator, VP of Engineering and Maintenance, adds that the mill is "way ahead of the start-up curve. The production line is beating plan by about 20% per month. We're almost double where we planned to be in terms of efficiencies."

### Filling a void

When Barton first opened, it was SCA's first full-scale greenfield paper mill start-up in the world (see the story "From cotton field

to greenfield" in *FiberSpectrum Issue 2-2005*). The Barton operations were home to PM12 – the first ANDRITZ PrimeLine tissue machine in North America. PM12 produces heavier toweling and dispenser-type napkins from 17-53 gsm. Trim is 5.5 m and top machine speed is about 1800 m/min.

"We are very pleased with the start-up and performance of PM12," says Phiscator. "We didn't have to travel very far to get a good reference for ANDRITZ."

According to Marty Ferguson, SCA Tissue's Operations Director for the Southeast, the new PM14 "fills a void" in SCA Tissue North

*"PM14 fills a void in our lightweight Tork® brand tissue and two-ply dinner napkin products. We can now produce about 95% of our products in-house, close to our customers."*

Marty Ferguson, SCA Tissue's Operations Director for the Southeast



America's Tork® brand tissue and two-ply dinner napkins in the 14-25 gsm range. "The driving force was that we had a 70,000 t/a shortfall in lightweight tissue production," Ferguson says. "We were purchasing a high percentage of parent rolls and wanted to become more balanced between papermaking and converting. PM14 is part of our closer-to-the-customer strategy. We can now produce about 95% of our products in-house. We are basically running to order now. This helps us optimize our scheduling, keeping inventories low while increasing our service level."

### Following the plan

"The main justification was to improve our ability to support our customers in the Southeast. The Board approval for the project came in February 2007, construction began in August 2007, and the machine started up in October 2008."

Actually, the new production line was planned for from day one, says Phiscator. "The PM14 project followed the same basic design philosophy as for PM12," he says.

*"The start-up was uneventful. I say that as a high compliment."*

Mark Phiscator, SCA Tissue's Vice President of Engineering and Maintenance

"From the outset, this mill was designed for expansion. Extra piping tees, tie-ins, lines, etc. were installed so that new equipment and systems could be added."

The overall design for PM14 follows that of the existing line in that the deink plant and tissue machine are considered as one unit. "PM12 has its own deink plant and tissue machine, and one team runs the entire operation," Phiscator says. "We did exactly the same thing for PM14."

Andy Chorney of SCA Tissue took the mechanical lead on the project team. "We spent time up-front to get this right," Chorney says. "The project took 18 months from engineering to start-up. In the project business, time costs money. The sooner we get the machine producing revenue for us, the better we are."

Chorney was pleased with the transition from engineering drawings to reality. "Everything looks good on paper," he says. "It's not until you get into the field that you see how good your design really is. In this



*“The quality of wastepaper is a moving target. Wastepaper today is more contaminated and the adhesives are more troublesome.”*

Tony Epie, Assistant Superintendent

Tony Epie (left), Assistant Superintendent for PM 14’s deink plant, with Richard Turnbull (ANDRITZ Regional Representative) in front of the deink cells. ▼



Tim Fulmer (left), SCA’s Electrical Lead, consults with Andy Chorney, SCA Tissue’s Mechanical Lead, on the deck of an ANDRITZ disc filter in the stock prep area. ▶

case, we did a lot of things right. We had to make some modifications in real-time, but really these were minimal. We had very good cooperation and coordination from everyone involved.”

#### Performance guaranteed

SCA Tissue chose one supplier, ANDRITZ, to deliver both the deink plant and the tissue machine. Haeffele explains: “By limiting the number of suppliers we get better performance guarantees and better performance. It is easier to manage the project with fewer interfaces and the suppliers become actual partners in your success.”

“ANDRITZ was very flexible in working with us to tweak the process and the machine the way we wanted,” says Sarah Freeman, Assistant Superintendent responsible for PM14. “For example, we asked for some enhancements to the showering system and the reel section. We had a very good experience with ANDRITZ on PM12. This machine is like the first one, very high quality and sturdy construction.”

According to Haeffele, “We made some enhancements that make this CrescentFormer machine ideal for producing lightweight tissue at high speeds. PM14 has a two-layer headbox compared with the single-layer headbox on PM12. The excellent CD profile



is achieved through dilution profile control (weight) coupled with moisture control via a steambox located at the suction pressure roll. With the PrimeLine CrescentFormer, you get a very nice, filled-in sheet for lightweight grades. When you’re making a sheet that’s only about a fiber and a half thick, it’s got to be filled in. You also have no wire-to-felt transfer, which dramatically improves performance at very high speeds.”

#### Waste stream challenges

“We make products that are 100% recycled from more than 250,000 tons of wastepaper per year,” says Tony Epie, Assistant Superintendent responsible for PM14’s deink plant. “PM14 does not swing from brown to white grades like PM12, so we chose the FibreFlow® drum pulper. This gives us better yield and screens out the main contaminants early in the process,” Epie says.

The quality of wastepaper is a moving target. “Wastepaper today is more contaminated and the adhesives are more troublesome,” Epie says. “MOW is mainly shredded, and generally contains a lot of paper clips, compact disks, various plastics, and sometimes a high percentage of groundwood. We teach our technicians to visually identify and remove the key sources of stickies before the waste ever gets into our system.”



◀ The ANDRITZ Mixed Office Waste (MOW) DIP system for SCA Barton is rated for 350 bdst/d production for PM14. In the first loop, accepts from the FibreFlow® drum pulper go through two stages of high density cleaners, three stages of coarse screening, three stages of forward cleaners, and three-stage fine cleaning. The second loop is the bleaching loop, which has flotation and two stages of bleaching.



*“ANDRITZ was very flexible in working with us. We had a very good experience with them on PM12. The start-up on PM14 went very smoothly.”*

Sarah Freeman, SCA’s Assistant Superintendent for PM14

In addition, SCA runs the first loop much cooler than on PM12. “This gives us a better chance of removing the stickies before the heat of the process makes this more difficult,” Epie says.

#### Flexible and robust

“The ANDRITZ deink plant has a high degree of flexibility and robustness built in,” Epie says. “It can handle a wide variety of waste steams. The main target is to deliver a low-ash furnish to the machine without compromising yield. Our target is under 4% ash in the HD towers. We chose aggressive washing to remove the ash, clay, and inks. The furnish is 100% bleached, ranging from 68 to 75 ISO. The yield is about 70% at the deink plant and 67% overall.”

#### Uneventful?

“The start-up at SCA Barton was uneventful,” Phiscator says. *Uneventful – for a USD 145 million expansion project?*

“I say that as a compliment.”

“I’d say it went very smooth,” Freeman contributes. “We selected four of our top tech-

nicians to prepare the training for PM14. They developed the materials, coordinated the sessions with suppliers, and cross-trained all the operators. We were very well prepared for the start-up in October.”

Ferguson notes that one of SCA’s primary measurements is what they call Top Speed Non Stop (TSNS). “If we could run at full speed all the time, the score would be 100,” he says. “Our TSNS scores are improving – and we have seen very good numbers from the PM14 line.”

“The ANDRITZ machine is very well built and has excellent quality,” says Phiscator. “It is capable of achieving high speeds and is stable. The machine is definitely operating ahead of plan at this point in time.”

Tim Fulmer, electrical lead for the project, was responsible for the selection of process controls, automation, and machine controls. “We had our normal issues that we have in all projects,” Fulmer says. “But the start-up was excellent. We all did a good job of commissioning the systems.”

“The start-up was smooth,” says John Schamell, Project Director for ANDRITZ and head of the company’s paper machine business in North America. “I attribute this to three main factors. First, you have a well-designed standardized machine. Second, on site we had extremely qualified people to commission the machine and resolve any issues. And probably most important, we have a customer who knows its business. The operators and supervision here are highly trained and qualified. SCA is one of the best customers to work with. They are reasonable and fair and very open to constructive discussions.”



CTMP in the middle layer of Klabin's board adds **bulk and stiffness.**

## Board stiff: liquid assets at Monte Alegre

Brazil's Klabin made a strategic decision to focus on high-value board and packaging papers. A major investment at their Monte Alegre Mill allows Klabin to lower basis weight while improving board stiffness and printability. Central to this is the output of a new CTMP plant.



▲ ANDRITZ supplied what is today the world's largest eucalyptus CTMP mill: 140,000 t/a. It is also the first producing 100% eucalyptus CTMP for liquid packaging board.

The three-hour drive from ANDRITZ's offices in Curitiba to the Klabin Monte Alegre mill in Telêmaco Borba winds its way through plantations of araucaria, pine, and eucalyptus. "The mill, which started in 1946 when Brazilian government started an incentive plan to develop the local industry, is a sprawling complex sitting atop a steep hill between two rivers.

In total, Klabin owns about 449,000 ha of forest, of which 224,000 is plantation. This mix of fiber is a competitive edge, according to Francisco Razzolini. "We use short and long fibers together in combinations that give us both technical and cost advantages."

Razzolini was Project Director for the MA-1100 project ("MA" for Monte Alegre and "1100" for 1.1 million tonnes of paper/board

production). This investment was Klabin's largest to date, totalling BRL 2.2 billion (EUR 719 million). This is the first project worldwide to focus on board making equipment for packaging liquids.

### Select group of suppliers

In 2003, Klabin sharpened its focus to concentrate on packaging papers and higher value-added coated board products – LPB, folding boxboard, and carrier board. "Our strategy is to produce paper and board products that are on the high-end side where the cycles are less severe," says Arthur Canhisares, Industrial Director for Klabin. "When you move to higher valued-added products, usually it's much more stable and there are fewer market entrants."

Klabin has a 25-year history of supplying LPB to Tetra Pak. Canhisares remembers

when it all started – back when shipments totalled about 6000 tonnes per year. This year, the target is more like 400,000 t/a. "Our investments are significant to remain part of this select group of suppliers," Canhisares says.

In addition Klabin just culminated a six-year program leading to the Total Productive Management (TPM) Award from the Japanese government. It is the first Brazilian company from the pulp and paper sector to obtain this certification. This focus, and the intense desire to "make the best board in the world," led to the MA-1100 project.

### MA-1100 project

Actually, the project was conceived as MA-900 (900,000 t/a production), but, as always, the Klabin team found ways to set the target higher – and meet the higher

goal. As Razzolini explains: “We basically installed a new mill inside the existing one: new woodyard, CTMP mill, upgrades to the kraft digesters and bleaching plant, CLO<sub>2</sub> plant, coating kitchen, two sheeters, lime kiln, recovery and power boilers, turbo-generator, automation, electrical distribution, expansion of the warehouse, and doubling the size of our effluent treatment plant.”

The logistics were very complicated. One issue was how to handle the workforce. “On average, we had 4500 construction people on site, with a peak of 7000,” Razzolini says. “We built lodging for 3000 people, created restaurants to provide meals, and managed the bus transportation for the people working on the project.”

“Our main challenge was to install all this equipment in the middle of a mill that was running at full capacity,” João Braga, Project Manager, says. “The plan was not to disturb production and raise capacity from 700,000 to 1.1 million tonnes in 22 months.” With

*“Our main challenge was that we installed all this equipment in the middle of an existing mill that was running at full capacity.”*

João Braga, Klabin's Project Manager



▲ Jorge Mudri, Fiber Line Manager at Monte Alegre (left) with Giani Valent, ANDRITZ's Project Manager in front of the MSD chip press.

◀ Marcos Freitas, an ANDRITZ Automation technical specialist in Brazil, with the FiberVision™ online pulp analyzer.

one exception, the schedule was met and start-up began in September 2007.

#### High-yield CTMP is key

“With the installation of a new board machine, we had to decide whether to improve our existing pulping process or to use a new fiber in the board composition,” says Jorge Mudri, Fiber Line Manager at Monte Alegre. “We first looked at increasing our existing kraft capacity.”

According to Mudri, kraft is an important part of the mix, “but there is one special requirements for our board,” he says. “A major quality that we want to enhance in our boards is stiffness. This allows consumers to grip the juice or milk carton without it collapsing.”

Chemi-thermo mechanical pulp (CTMP) is sometimes used to give bulk to the board. Bulk means better caliper – and better caliper is related to the stiffness or bending index of the final product.

“We first purchased CTMP from Canada for folding boxboard,” Mudri says. “Then, we did a mill trial with Tetra Pak using CTMP in LPB on our existing board machine.” Pleased with the initial results, Klabin wanted to run more sophisticated tests with the idea of installing their own CTMP process. “We performed trials with different grades of CTMP at ANDRITZ's Springfield, Ohio laboratory in 2004 and 2005,” Mudri says. “We decided that 100% eucalyptus for CTMP was the way to go.”

“When we started, ANDRITZ was very easy to collaborate with,” Razzolini says. “They opened their pilot plant to us. Together, we found a process that met our needs. The development was intensive and productive and came to a very nice process solution.”

#### The first in the world

ANDRITZ supplied what is today the largest eucalyptus CTMP mill in the world: 140,000 t/a (432 t/d design). It is also the first producing CTMP from 100% eucalyptus for liquid packaging board. The plant was delivered on an EPC basis, with Klabin doing the civil/structural work. In addition to the CTMP plant, ANDRITZ also delivered an effluent evaporator, a wet lap pulp machine, and a deshive refiner for the kraft pulping line.

The building that was to house the new CTMP plant was occupied by an old stone groundwood plant which had been shut-down in 2003. Inside were 15 large grinders. “It was a challenge because we had to plan the internal layouts to fit the structure,” says Maurice Garvie, ANDRITZ's Project Director. Klabin's work was substantial: dismantling the old equipment, reinforcing the structure, and opening space for the new equipment. “It was very, very challenging for us, ANDRITZ, and the civil contractors,” Razzolini says. “But, we were all able to manage this in a positive way.”

Giani Valent, Project Manager from ANDRITZ's Curitiba office, recalls the complexity: “We started mechanical erec-



*“When we started CTMP development, ANDRITZ was very easy to collaborate with. Together, we found a process that met our needs.”*

Francisco Razzolini, Project Director

tion outside with the MVR evaporator in November 2006, and as each area inside the building was readied, we quickly moved our equipment in,” Valent says. “It took a lot of coordination and communication to keep to the schedule.”

As per schedule, the first bales of wet lap pulp came out of the new CTMP plant on September 27, 2007.

In the CTMP plant, the basic process stages are chip washing/screening; impregnation with an MSD chip press; mainline refining (S2070 70-inch single disc refiners with 14 MW motors); screening; rejects refining (Twin Flo); thickening (disc filter); and three-stage washing (screw presses). Mudri says that washing is very important. “Liquid packaging board must have no resins or smell,” he says.

The effluent evaporator is a mechanical vapor recompression (MVR) style to reduce the environmental load of the CTMP plant. When Klabin applied for environmental permits for the mill expansion, it agreed not to increase emissions in spite of the increase in production. “The CTMP plant does not discharge to the effluent treatment plant,” Valent says. “The effluent from the CTMP is about 1% solids. It is evaporated in the MVR to about 20% and sent to the main evaporators.

#### 21 hours a day

“The specific energy consumption of the refiners is an important consideration for us,”

*“The investments are significant, because you have to develop the quality, the technology, and invest in your people to be part of this select group of suppliers.”*

Arthur Canhisares, Industrial Director





*"The reliability of the CTMP plant is very good. Maintenance is easy. Even though it was a new technology for us, we had very good training before start-up and our people are well prepared."*

Arnaldo Jasinski, Maintenance Coordinator

Since fiber for Liquid Packaging Board must meet strict cleanliness standards, ANDRITZ delivered a system where the pulp passes through a disc filter and a three-stage screw press washing system. Shown below is one of the screw presses and the rejects refiner. ▼



▲ Daniel Scigo, Analytical Supervisor with Sindus Andritz, checks the calibration of digital instrumentation in the new CTMP plant. Sindus Andritz has 40 professionals at work in the Monte Alegre mill complex.

Jean Baril (standing), a Senior Process Engineer with ANDRITZ, works with an operator in the control room at Klabin. Baril was instrumental in the process engineering, commissioning, and start-up, and has provided guidance to Klabin's operators as they learned the new CTMP technology. ▼



## ABOUT SINDUS ANDRITZ

In 2007, ANDRITZ acquired a 50% stake in Sindus Human Technology, a Brazilian company specializing in maintenance services for the pulp, paper, and other industries. Sindus moved into maintenance outsourcing of instrumentation and control systems in the early 1990's.

Sindus Andritz hires, trains, staffs, and performs all the related maintenance and repair work in the mill. Today, there are about 700 employees in Brazil working at 15 key sites. Sindus Andritz works with all the key pulp and paper producers in Brazil.

Mudri says. "We produce consistent quality with lower variable costs with the ANDRITZ equipment."

The CTMP plant adheres to a strict start-up and shutdown schedule each day. "Energy is a big variable cost for Monte Alegre, as about 35% is purchased," says Mudri. "In Brazil, we have peak hours five days a week (3 hours a day) where the price of energy is about five to six times higher than the average. We designed the CTMP plant to achieve our required production in 21 hours each day."

Klabin's operators have become very skilled at starting and stopping the process efficiently. "One important decision was to use the I.D.E.A.S. Simulator," says Guilherme Sprung, Klabin's Project Manager for the energy and automation areas. "Our operators did not have experience with the CTMP process or the CFB power boiler, so decided to use the Simulator for these areas. Our operators learned quite quickly about how to control production with the training they did during simulation."

### Good and stable operation

"During the commercial phase, ANDRITZ did an excellent job and offered us a very attractive investment," Razzolini says. "During installation, the project went very well and the start-up was smooth. I can say we are very, very satisfied with the results

we have from the project and from the quality of the product, and also the performance of the overall CTMP plant."

"You can tell a lot about a supplier by its actions during a project," Braga says. "ANDRITZ's behavior was very good. Response to problems was extremely fast. Every action was focused on solving the problem, not pointing fingers or arguing about who pays."

"While we had worked with ANDRITZ on smaller installations, this was our first major project with ANDRITZ," Mudri says. "The performance of the technology is better than the trials we did and we are very, very satisfied with the results that we are getting from the CTMP on eucalyptus."

What started as a small amount of CTMP in the middle layer of Klabin's high-value board has grown significantly because of the excellent bulk and stiffness. "Our goal for bulk is 3.2 cm<sup>3</sup>/g, but we are consistently achieving in excess of 4.0," Mudri says. "Today, we produce the same grades with the same or better quality than before," Mudri says. "But now, our grammage is lower. This means our customers get at least 5% more surface area for the same tonnage – which translates into increased profits for them."

## The best chips in the world?

When the time came to modernize the woodyard at the Varkaus mill, it was not a moment too soon. The old equipment was replaced with ANDRITZ's newest technology and the results have been extraordinary. "We just might have the best chips in the world now," says the pulp mill production superintendent.

The Varkaus mill in Finland can trace its roots to 1830. Pulp production includes ECF at about 225,000 t/a, TMP at about 250,000 t/a, and recycled fiber at about 100,000 t/a. Up until recently, it had been a struggle for the woodyard to keep up with chip production for the TMP and kraft lines, plus processing bark for the power boiler.

"The oldest part of our woodyard was installed in the 1950's," says Ville Varis, Production Director for the pulp mill. "While we were able to make some small investments to rebuild part of the plant to 1970-1980's technology, basically the equipment was totally worn out."

### High risk

"We were taking downtime for repairs," Varis explains, "and there was a risk that paper production would be impaired." Varkaus was also the last mill in the Group to operate without a log de-icing system.

"Frozen logs do not debark properly," says Jouni Hiltunen, Production Superintendent for the pulp mill. "We would find dark spots in the paper during the winter time due to poor debarking."

Chip size distribution was quite variable, to put it mildly. "There was a lot of variability in size, which impacted our fiberline," Hiltunen says. "And we were experiencing up to three percent wood losses in the chip screening process alone."

In short, the woodyard had become high risk potential. "We were hanging on as best we could," Varis says, "but we knew that very large investments would be required within the next two years just to repair the old equipment in the woodyard."

Stora Enso's Board approved the investment for a new woodyard in March 2006. The main equipment was purchased from ANDRITZ in June of that year.

"We have been through many innovations together with ANDRITZ," Varis says. The Varkaus mill is the site of their first friction-driven debarking drum, the first rotary screen, development of the de-icing system, testing of the first chipper, the first displacement bleaching system, and the first Zedivap® effluent evaporation system.

### Small is the trend

Why ANDRITZ? "They guaranteed the lowest wood losses," Varis says. "We visited a reference installation at Joutseno that was quite convincing. They demonstrated that they could precisely control the chip quality as conditions changed. We really wanted that level of flexibility here in Varkaus."

This flexibility is especially important due to recent trends in wood harvesting. "With a heavy export duty pending for raw logs from Russia," Varis says, "we are seeing a dramatic swing to smaller log sizes in Finland."



*"We received a big efficiency improvement with a one-time investment."*

Ville Varis, Pulp Mill Production Director at Stora Enso's Varkaus mill

◀ Jouni Hiltunen, Production Superintendent, Pekka Kokko, Chief Woodyard Engineer for ANDRITZ, and Ville Varis, Pulp Mill Production Director, oversee one of the debarking lines (left to right).



▲ The ANDRITZ woodyard at Varkaus consists of a two-line debarking, chipping, and screening operation. Softwood capacity is 350 m<sup>3</sup> sob/h, while hardwood capacity is 250 m<sup>3</sup> sob/h.

*"We may just now have the best chips in the world."*

Jouni Hiltunen, Pulp Mill Production Superintendent



"There is a high proportion of first thinnings, younger wood, and smaller diameter logs in general. More logs are required – and more debarking – just to achieve the same production volume."

### From worn to wonderful

Construction work began at the site on July 31, 2006. "We worked through a cold winter in Finland," Varis says. "You can imagine the challenges of doing the civil construction in frozen ground!" ANDRITZ began installing the main machinery in March 2007. Commissioning began in August, and start-up began September 7, 2007 as per the agreed schedule.

The Varkaus woodyard represents the most modern and efficient wood processing technologies for cold climates, according to Pekka Kokko, Chief Engineer for ANDRITZ Wood Processing. There is a two-line debarking plant with de-icing (PowerFeed™), two large HHQ-Chippers™, JetScreen™ chip separation and screening

systems, and ChipScan™ chip quality analyzers. Softwood capacity is 350 m<sup>3</sup> sob/h (solid over bark per hour), while hardwood capacity is 250 m<sup>3</sup> sob/h.

Spruce logs go directly to the adjoining sawmill. Chips from the sawmill go to the TMP line, along with chips from spruce pulpwood that is processed in the ANDRITZ system. Bark from the sawmill is mixed with bark from the woodyard to go to the power boiler. Pulpwood goes to the ANDRITZ system for the kraft line. The 800 t/d digester swings quite frequently between hardwood (birch) and softwood (80/20 pine to spruce), with a campaign lasting from one-half to two days.

"One worry I had before the project was that we would improve chip quality, but that the chip size would be too large," Varis says. That has not been the case. "We have gradually controlled the chip size from 28 to 30 to 32 mm in one year. We are getting better cooks in the digester with less rejects."

## FROM PULP TO CAVIAR

Sturgeon have been under heavy fishing pressure for their caviar (the roe of the female fish) and their meat. Carelian Caviar Oy raises Siberian and Beluga sturgeon using environmentally sustainable techniques, which help to protect wild sturgeon to some degree. The fish farm in Varkaus recirculates heat from the Stora Enso Varkaus mill, maintaining year-round optimal conditions for the sturgeon. The largest Belugas can weigh over 1500 kg and can live to be over 100 years old. Caviar from this species is the most delicate and expensive in the world.

Jani Rantula of Carelian Caviar Oy holds a Siberian sturgeon, which is being raised on a fish farm adjoining the Varkaus mill in Finland. The fish farm heats water for the massive fish tanks using excess heat from the Varkaus mill. ▼



▲ The bottleneck in the Varkaus mill's fiberline was the chip feeding system. In November 2007, ANDRITZ installed a Diamondback® chip bin and TurboFeed® chip feeding system, "January and February of 2008 were two of our best months for production since I have been at this mill," Varis says. "Normally, the winter months are very difficult for us, but the improved chip quality and the new feeding system have been excellent."

"A side benefit of the dry debarking technology from ANDRITZ is that the fuel quality (bark) to the power boiler has improved significantly," Hiltunen says. "We've seen a 60% reduction in wastewater from the woodyard and a huge reduction in phosphorous and COD."

### Huge efficiency improvements

With the woodyard fully operational in November 2007, the Varkaus mill immediately began to see results. "We received a big efficiency improvement with a one-time investment," Varis says. "When I came to this mill in 1999, there were 55 people working in wood handling. Today, there are 13. Secondly, we have witnessed a dramatic reduction in maintenance costs. Third, the savings as a result of material efficiency improvements (reduced wood losses, higher chemical pulping yield, etc.) are substantial."

"We use the ChipScan™ analyzer online to get accurate data on chip length, thickness, and variability," Hiltunen says. "Before we put in the ANDRITZ system, our distribution was 50 to 62% in the optimum accept chip

size, and about 20% in the smaller accept size. Now we're seeing optimum chip size over 80% of the time and only 10% small accepts. Meanwhile, we have reduced pins and fines from 9% down to 1.8% and our screening losses are about 1/10th of what we had with the old system. These are quite extraordinary results."

Hiltunen was extremely positive about the technologies in the woodyard. "The PowerFeed™ infeed conveys log bundles to the debarking drum without bridging in any weather condition," he says, "There is efficient de-icing and the low filling degree in the drum results in lower mass forces and reduces our wood losses. Bark and sand are efficiently removed. The JetScreen™ makes it easy to optimize chip quality for the digester. Chip quality is adjusted simply by adjusting the air pressure. You can't flood the screen during peak loading periods. The HQ-Sizer converts about 80% of the overthick and oversized into accepts."

### Better chips, better pulp

"There is a very clear improvement in the fiberline operation after start-up of the new

woodyard," Varis says. "It took us a while to adjust the process to the large chip size and the higher proportion of optimum chips – and we're still improving it each week."

The bottleneck in the fiberline was the chip feeding system, especially with softwood. So, during a two-week shutdown in November 2007, ANDRITZ installed a Diamondback® chip bin and TurboFeed® chip feeding system on the Varkaus digester.

"After the restart of the fiberline in December, we were very happy because we no longer have a bottleneck in chip feeding," Varis says. "It is difficult to say how much benefit is coming from the chip quality and how much is coming from the pre-steaming and feeding. But I can tell you that January and February of 2008 were two of our best months for production since I have been at this mill. Normally, the winter months are very difficult for us, but the improved chip quality and the new feeding system have been excellent."

FIND OUT MORE AT  
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Logs being loaded into one of the PowerFeed™ infeed conveyors at Varkaus. The mill now has efficient de-icing with two temperature zones and the ability to load both long or short log bundles without bridging. ►



▲ The ChipScan™ online analyzer gives operators accurate data on chip length, thickness, and variability in real-time.



▲ The JetScreen™ thickness screen makes it easy to optimize chip quality for the digester. Chip quality is adjusted simply by adjusting the air pressure inside the unit.



## Solving a sticky situation

A prime example of working closely with a customer to develop the right technical solution is the cooperation between ANDRITZ Küsters and a unique papermaker in Burgos, Spain.

*Double security fence around the perimeter; walk-through metal detector; x-ray machine for hand baggage; guards with loaded pistols. Are we at a paper mill, or the airport?*

The sign says Fábrica Nacional de Moneda y Timbre (FNMT), the national factory for the production of currency and stamps. So, we must be in the right place. FNMT

concentrates on the production of paper for banknotes, stamps, lottery tickets, and other products which have self-adhesive properties. These so-called "special security papers" appear to require their own level of high security.

### Avoiding a sticky mess

The days of licking postage stamps and then grimacing because of the bad taste

will soon be a distant memory. Now, you get booklets with self-adhesive stamps that you peel off from the backing sheet. But, this is not easy to produce.

Both sides of a postage stamp must be uniformly coated and finished – but with entirely different substances. "The top side must allow for printing and the necessary security features," José Mendia, Engineering & Maintenance Manager for FNMT Paper Mill. "The bottom side contains a sticky adhesive, but sticky only after the stamp is removed from its backing sheet."

### Trials and trials

"The post-production of stamp paper requires a mastery of at least two skills: coating and finishing," says Roland de la Pille, Area Sales Director of paper finishing systems for ANDRITZ Küsters. "Coating both sides and then calendering the paper without reactivating the sticky adhesive presented us with an interesting challenge."

*How do you calender the paper without it getting stuck to the rolls?* "You don't ... at least not the first time!" de la Pille says with a hearty laugh. "This is how ANDRITZ Küsters and FNMT became such good working partners. We jointly arrived at a solution that was greater than either of us could have accomplished independently. It took several trials at our technical center in Germany, but we were able to find the perfect solution together."

### Out of the lab, into the plant

Mendia is quite pleased with the result. "The calendar is the key to the new paper quality," he says. "Although developing coating media may be very innovative, its use stands and falls with the results that calendering brings about."

After the trials, the installation of a Prime Cal ProSoft calender at Burgos began in May 2008. The calender is in-line with a com-



▲ A new roll of paper is being loaded into the ANDRITZ BMB coating system, which is followed by online calendering on the ANDRITZ Küsters equipment.

Close-up of calender showing PrimeRoll S EdgeTrim (top and bottom) and heated roll (center), putting the finishing touches on adhesive stamp paper. ▼



ANDRITZ Küsters PrimeCal ProSoft calender (foreground) with BMB coating station ▶

plete coating station previously supplied by BMB (now an ANDRITZ company and part of the same paper finishing group).

The stack contains three rolls – a PrimeRoll S EdgeTrim in the upper and lower positions and a thermoroll in the middle. The top and bottom rolls have special zones filled with oil, which correct for profile deformation. "Plus, here at FNMT the swimming rolls have elements that take away the deflection forces at the edges, so the paper profile is flat across the entire width," de la Pille says.

"The middle roll is the heated roll," de la Pille continues. "We run it at a lower temperature for adhesive-backed papers so that the adhesive is not reactivated." It is the interaction between roll temperature and residual moisture which makes it possible for the sticky coating mass to adhere to the paper and not to the rolls.

"We also installed the MultiMaster automation system to give FNMT very efficient process control," de la Pille says. "They have the ability to pre-program certain configurations which saves valuable time when changing or setting up products."

"ANDRITZ Küsters has been a very good partner in the development of new coating recipes and their adaptations to the

calendar," says Javier Baraja, Production Manager at Burgos. Baraja explains that FNMT must often adapt processes according to individual customer specifications. The technical versatility of the calender opens up the chance to actively optimize products in cooperation with customers.

### Value, not volume

Annual order quantities at FNMT vary significantly depending upon the customer, but the tonnage is small compared to commodity grades. "We must be highly specialized and highly flexible to satisfy our customers' demands in a profitable way, despite comparatively small volumes," FNMT Paper Mill Managing Director Antonio Olmos says. "One of the ways we do this is by regularly investing in new technologies."

The recent modernization at FNMT is a good example of this. The mill improves its productivity by combining the coating station and calender in one unit. It improves quality due to precision coating and precise paper finishing.

"We are very, very pleased with the performance of the ANDRITZ equipment," Mendia concludes. "This has been a very strong and good partnership."

FIND OUT MORE AT  
[www.spectrum.andritz.com](http://www.spectrum.andritz.com)



From left to right: Roland de la Pille (Area Sales Director for ANDRITZ Küsters), José Mendia of FNMT, and José Corominola of Copapres, ANDRITZ's local representative, next to the coating/calendering station. ▼



## “Big One” starts up in Durban

Sappi Saiccor's Amakhulu Project at the KwaZulu-Natal mill (Amakhulu means “big one” in Zulu) boosted production, preserved the culture, and improved the quality of life around the mill's Durban, South Africa location.

Sappi Saiccor is the world's largest producer of chemical cellulose (dissolving) pulp for textiles and specialty markets. According to Alan Tubb, Saiccor Chief Executive, dreams of expanding the Saiccor mill began in 2005, with an increase in market demand and the successful completion of a debottlenecking project which was Amakhulu's forerunner. In addition to increased capacity, a major motivator was to leverage opportunities to reduce the mill's emission volumes and reliance on fossil fuels.

“By investing in the best technology, we have managed to increase our profit margin while decreasing our environmental impact,” explains Tubb. The mill has reduced its dependency on fossil fuels significantly and has seen a substantial reduction of effluent dissolved solids. Saiccor has also managed to maintain the same water con-



*“The Amakhulu Project affords us an opportunity to grow our market leadership.”*

Gary Bowles, Sappi Saiccor General Manager

sumption despite the additional 200,000 tonnes pulp capacity.

### ANDRITZ's contribution to Amakhulu

Project Director and Sappi Group Head of Technology, Andrea Rossi, explains that ANDRITZ's involvement in the Mkomazi expansion project in 1993-1994 proved a major motivator in choosing the company again as major supplier for the woodyard, bleaching, drying, and evaporator deliveries for Amakhulu. “ANDRITZ has a very good local technical presence,” Rossi says. The local office hired site, safety, quality, purchasing and scheduling personnel, and the office sourced many of the materials, platforms, supports, piping, tanks, and vessels as well as the local mechanical and piping erection contractors.

“ANDRITZ offers a basket of technology,” says Gary Bowles, Sappi Saiccor General Manager, “that makes our interfacing far more streamlined.”

The contribution went beyond technology. Backed with the financial support of ANDRITZ and other EPC suppliers and contractors, Saiccor set up a training school in the local community. Combined with the 1000 temporary and permanent jobs offered by the project, living conditions were improved for many of the local population.

### New woodyard technology for Sappi

ANDRITZ supplied a turnkey woodyard – incoming log receiving deck, log washing system, chipper, chip belt stacking system, chip reclaiming, and conveyors. With it, the mill is able to take on a larger volume of logs of up to 6 m in length. The HHQ-Chipper™, the first of its kind in South Africa, handles large diameter logs.

When asked why it has taken South African mills this long to invest in horizontally-fed

chipping technology, Tony Neave, Saiccor's Plant Manager for Pulp Preparation, explains that it is always hard to move away from proven technology. However, since taking the plunge, Saiccor has achieved a chipping rate 10% higher than the original design rate. In terms of general runnability, the chipper is less problematic than Saiccor's existing chippers and far more user-friendly.

### Surpassing design targets in the bleach plant and drying line

The ANDRITZ technology includes the delivery of fine screening, oxygen stage, and four-stage ECF bleach plant. The plant is based principally on the mill's Bleaching Plant 3, delivered by ANDRITZ in 1994-1995, including six conventional vacuum filters for brownstock washing and the bleach plant. The new bleach plant has been operating at 1020 admt/d – already surpassing its design target.

ANDRITZ also installed a turnkey pulp drying line which includes the approach flow system, pulp machine, airborne sheet dryer, a densification press, a cutter/layboy, and automated baling line. Most impressive in ANDRITZ's delivery is the twin wire forming technology (a new technology for Saiccor) and the inclusion of a PrimePress X shoe press from ANDRITZ Küsters in the press section. The PrimePress X reduces Saiccor's operating costs through its increased moisture extraction, necessitating less steam in the drying plant.

Next in line is the ANDRITZ airborne sheet dryer with a heat recovery system. Following the dryer, an ANDRITZ Küsters PrimeCal Hard calender is utilized as a densification press to flatten the density profile prior to the cutter. ANDRITZ delivered the cutter/layboy and automated baling line (baling, bale storage, and bad bale treatment), including the BaleMatic™ control system.



▲ ANDRITZ supplied a turnkey woodyard, including the first HHQ-Chipper™ in South Africa. The ECF bleach plant design is based on the mill's Bleaching Plant 3, delivered by ANDRITZ in 1994-1995. The new bleach plant has been operating at 1020 admt/d – already surpassing its design target.



*“Any improvement you get in the woodyard ultimately benefits the end product.”*

Tony Neave, Plant Manager, Pulp Preparation

“This was a challenging project for us,” says Bernd Asbeck, ANDRITZ's Project Manager for the drying plant. “The drying of dissolving pulp was a new process for us,” Asbeck says. “The physical design was significantly influenced by the low pH of the stock. We had to redesign the entire machine to make the engineering suitable for manufacturing with the special materials required for the corrosive environment.”

Skyrocketing stainless steel prices formed a major financial drain for the Amakhulu project. “We were competing not only with international demand for materials, but also a strong local demand with the 2010 Soccer World Cup construction beginning,” explains Rossi.

In addition to the technical challenges, Asbeck and his team met the usual project

challenges. “The biggest challenge was time,” Asbeck says. “We were on a tight schedule, with installation beginning in May 2007 and start-up one year later. We were doing the full erection of the drying line systems, not just erection supervision. We focused on finding the right quality-minded sub-suppliers, inside and outside of South Africa, and documenting their QA programs.”

In addition, “real estate” inside the mill was at a premium. “There were only small areas for laydown and erection preparation because the mill was in full operation during our construction and installation work,” Asbeck recalls. Despite being placed under tight deadlines and in an even tighter geographical location with limited access for civil construction, the drying line was finished two days ahead of schedule. Since

## THE ANDRITZ SCOPE

**WOODYARD.** Turnkey delivery of eucalyptus processing line and the first horizontal feed HHQ-Chipper™ in South Africa. Designed for 300 m<sup>3</sup> sub/h.

**FIBERLINE.** Fine screening, oxygen delignification, and ECF bleach plant for magnesium sulphite cooking process. Designed for 870 admt/d.

**RECOVERY.** Turnkey delivery of a 6-effect evaporator (largest in world for magnesium sulphite process) with condensate stripping and methanol liquefaction. Designed for 370 t/h evaporation.

**PULP DRYING.** Turnkey delivery of approach flow, pulp dewatering, drying, and baling line. 4.06 m working width. Designed for 930 t/d. PrimePress X shoe press from ANDRITZ Küsters

**SIMULATION.** I.D.E.A.S. Simulator for chemical recovery processes.

the production of the first bale on the 13<sup>th</sup> of May 2008, the pulp drying line has “exceeded many expectations,” says Krish Naidu, Mill Area Manager for Bleaching and Drying. “We have a very good working relationship with ANDRITZ. They are team-driven and customer-oriented in terms of satisfying our needs.”

**Conquering the large evaporator**

ANDRITZ also supplied Saiccor’s newest evaporator, which is currently the largest of its kind for magnesium sulphite applications. The plant concentrates incoming black liquor (12.5% dry solids) to 58% dry solids content before firing in the recovery boiler.

The units are especially constructed for the magnesium sulphite cooking process, with special emphasis on the production of clean reusable condensates. The plant is equipped with a methanol liquefaction system for stripping volatile gases which are then combusted in the boiler. The ANDRITZ technology is very different from Saiccor’s existing mechanical vapor recompression evaporators – a switchover motivated by the increased reliability of a multi-effect

evaporator. The existing evaporators require frequent shutdowns to mechanically clean scale build-up, while the new evaporators have internal heat surface washing in the sulphite liquor stages.

The evaporator transport and erection was a challenge. “It certainly forced ANDRITZ to think out of the box, which they did without complaint,” reflects Rossi. Five of the evaporator’s effects were transported whole, while South Africa’s weight restrictions on national roads forced the biggest effect to be dismantled, rebuilt into smaller pieces, and then transported by road. The vessels were positioned in place with a 450-tonne crane – one of the biggest in South Africa.

The evaporator plant has yet to be commissioned, although it has run successfully for short periods of time. A delay in the digester plant was induced when a leak of sulphur dioxide gas from a newly commissioned pipeline was detected in October, according to Colin Reddy, Mill Area Manager for Evaporation and Recovery. Although the malfunction was quickly isolated by the technical staff, the digesters subsequently had to undergo a shutdown while a more thorough investigation was made.

The ANDRITZ evaporation plant is currently the largest of its kind for magnesium sulphite applications. Colin Reddy (left), Mill Area Manager for Evaporation and Recovery, is shown with Ryno Eksteen, Managing Director for ANDRITZ (Pty) Ltd. in South Africa. ▼



*“The pulp drying line has exceeded many expectations. ANDRITZ is team-driven and customer-orientated in terms of satisfying our needs.”*

Krish Naidu, Mill Area Manager for Bleaching and Drying

▲ ANDRITZ delivered a turnkey pulp drying line which includes the approach flow system, pulp machine, airborne sheet dryer, densification press, cutter/layboy, and automated baling line. The pulp machine (above) features twin wire forming technology and a PrimePress X shoe press.

*“The drying of dissolving pulp was a new process for us. We had to redesign the machine to accommodate the special materials required for the low pH corrosive environment.”*

Bernd Asbeck, ANDRITZ Project Manager for the drying plant



**“Dynamic simulation is the way to go”**

Included in the delivery is an I.D.E.A.S. Simulator from ANDRITZ Automation, which allows Saiccor to perform logic and loop testing – and operator training – for its chemical recovery and boiler processes. Colin Reddy and his team were able to isolate and remove problems with the DCS configuration before the start-up. The simulator has been invaluable in training 200 new and existing staff at the mill. “I.D.E.A.S. has been extremely helpful for the start-up and training of operators,” says Rossi. “With skills levels as they are in South Africa, dynamic simulation is the way to go.”

**Project challenges**

Across the board, the biggest challenge to the expansion project was the resulting congestion and logistical dilemmas of expanding a brownfield site. With over 3000 people on site during peak construction, tremendous effort was placed on safety training. This certainly paid off, with an injury frequency rate of just 0.2% and a Lost Time Frequency Index of 0.18 for the eight million man-hours worked throughout the project.

With mills around the world forced to close their doors, one would have thought that the global recession would have been a major challenge to Amakhulu. However, the expansion was almost finished before South Africa was impacted by the recession. Although the plant was forced to run at approximately 70% of capacity for a number of months due to project-related aspects, “It is currently ramping back up to full capacity,” says Bowles.

The support of ANDRITZ has eased Sappi Saiccor’s upgraded mill into its first successful production runs. As Rossi explains, “We are extremely happy to have worked with all the ANDRITZ team members. They have had a very positive attitude and were willing to find the solutions to ensure we met performance requirements.”

## Highlights of NEW ORDERS

### COMPLETE LINES

Fujian Nanping Paper Nanping, Fujian, China RT-RTS TMP system
Kartonsan Karton Sanayi ve Ticaret Izmit, Kocaeli, Turkey Complete 227 t/d OCC line; rebuild of board machine approach system
Saigon Binh Dinh Paper Vietnam PrimeLine Compact tissue machine (working width of 2850 mm at reel and design speed of 1650 m/min) with steel Yankee, stock preparation, and automation

### KEY EQUIPMENT, UPGRADES, AND MODERNIZATIONS

Mondi Steti Steti, Czech Republic Debarking drum replacement, Waplan's hydrostatic supported support ring construction
MCC Meili Paper Industry Zhongwei, Ningxia, China Oxygen delignification and bleaching equipment

### KEY EQUIPMENT, UPGRADES, AND MODERNIZATIONS

DTE Energy Cassville, Wisconsin, USA Stokers for biomass handling
Fortum Termest Pärnu, Estonia Biomass boiler feeding system and ash-handling
Södra Cell Värö Värö, Sweden Flue gas cooler, recovery boiler retrofit
Weyerhaeuser New Bern, North Carolina, USA Recovery boiler retrofit
Stora Enso Oyi Imatra, Finland PrimePress X shoe press
Fripa Miltenberg, Germany "On-the-Fly" upgrade of stock preparation and tissue machine automation systems
JTI Yelets Lipetsk Province, Russia Press section for paper machine

### KEY EQUIPMENT, UPGRADES, AND MODERNIZATIONS

Domtar Kamloops, British Columbia, Canada Recovery boiler retrofit
<b>PANELBOARD</b>
XinJiang Jin Yang Mei Jia Wood Industry Miquan, Xinjiang, China 360 t/d pressurized refining system for MDF
Fujian Yongan Forestry (Group) Yong'an, Fujian, China 720 t/d pressurized refining system for MDF
Sichuan Guodong Construction Chengdu, Sichuan, China Two 720 t/d pressurized refining systems for MDF
Yingang (Chengde) Wood Based Panel Chengde, Hebei, China 864 t/d pressurized refining system for MDF

## Highlights of NEW START-UPS

### COMPLETE LINES

Australian Paper Maryvale, Victoria, Australia Cooking and screening modernization. New washing, oxygen delignification, and bleaching processes
VCP-MS Celulose Sul-Matogrossense Três Lagoas, Mato Grosso do Sul, Brazil World's largest single-line fiberline (cooking, washing, oxygen delignification, screening, and bleaching) and complete white liquor plant
Ence Group Navia, Spain New recovery boiler and biomass power boiler (first delivered by ANDRITZ), evaporation plant upgrade; upgrade to pulp drying line, including PrimePress X shoe press
Celulose Beira Industrial (Celbi) Leirosa, Portugal Upgrade of twin wire former, PrimePress X shoe press, new pulp dryer, cutter/layboy, and baling line, LimeKiln™, EPC delivery
PF Louisenthal Confidential end customer Bleach plant for cotton combers based pulp
Phong Khe Paper Bac Ninh, Bac Ninh, Vietnam Paper machine approach and refiner system
Henan Yingde Industrial Investment Holding Luohe, Henan, China Complete 640 t/d OCC line

### COMPLETE LINES

Lee & Man (Jiangsu) Paper Changshu, Jiangsu, China Complete 250 t/d Mixed Office Waste (MOW) line
Lee & Man (Dongguan) Paper Dongguan, Guangdong, China Complete 1000 t/d OCC line
Hengan Holding China PrimeLine tissue machine with two-layer head-box and dilution profiling system, virgin fiber stock preparation and fiber recovery systems. With this start-up ANDRITZ is the leading supplier to the Chinese tissue industry (nine machines in operation).
Hebei Yongxin Paper Tangshan, Hebei Integrated packaging board production line: PrimeLine machine with PrimePress X Twin shoe press, PrimeCal Hard calender, three PrimeFeeder feeding systems (including four JetBelts), a winder; OCC line (1000 t/d), AOCC line (250 t/d), complete plant automation.
Anhui Shanying Paper Maanshan, Anhui, China Complete 1000 t/d OCC line
Papeles y Cartones (Member of the Smurfit Kappa Group) Barbosa, Columbia Complete 350 t/d OCC line

### KEY EQUIPMENT, UPGRADES, AND MODERNIZATIONS

Stora Enso Fors Fors, Sweden PrimeCal Hard calender, PrimeFeeder, rebuild of drying section
Guangxi Laibin Dongtang Paper Laibin, Guangxi, China Two brownstock screening lines
Papierfabriken Cham-Tenero Cham, Switzerland PrimeCoat Curtain coater with a multi-layer die delivered in an off-line specialty coating machine. Working width of the machine 3280 mm and a machine speed of 1000 m/min.
Verso Paper Sartell, Minnesota, USA DCS upgrade, primary refiner control, and hydraulic system upgrades

### PANELBOARD

Industria de Compensados Guararapes Palmas, Brazil 384 t/d pressurized refining system for MDF
Pfleiderer Holzwerkstoffe Nidda Nidda, Germany 528 t/d pressurized refining system for MDF
Industria de Compensados Sudati Palmas, Brazil 384 t/d pressurized refining system for MDF

## ANDRITZ NEWS

### Service Center keeps customers rolling in the USA

Keeping everything rolling is a major challenge in a paper mill. With tight budgets, mills are focusing on getting maximum life and performance out of existing equipment.

The professionals at ANDRITZ Küsters Roll Service Center in Spartanburg, South Carolina, USA are experts in repairing, reconditioning, and even upgrading the performance of conventional

and deflection-controlled rolls (no matter who the original manufacturer is).

To learn more about the Spartanburg Roll Service Center's capabilities, or to receive a copy of their new brochure, send an email to [glenn.livingston@andritz.com](mailto:glenn.livingston@andritz.com) or call +1 (864) 587 4848.



## Next issue SPECTRUM

### Hebei Yongxin Paper inaugurates new packaging paper line

The official ceremony took place in April to celebrate the start-up of a complete ANDRITZ packaging paper line in China at Hebei Yongxin Paper Co. Ltd.

"The start-up was very smooth, thanks to ANDRITZ's advanced technology and our good cooperation," says Wu San Luo, General Manager.

ANDRITZ supplied the entire line: stock preparation plant, paper machine, winder, and the total plant automation. The line is designed to produce 400,000 tonnes of kraftliner and linerboard per year – making Hebei Yongxin Paper the largest containerboard producer in Northern China.

The next issue of SPECTRUM will feature interviews with key customer and ANDRITZ personnel about this important and interesting project.



## Maintain fiber quality and capacity while **lowering your energy costs**



**The challenge: Maintain fiber quality and capacity while lowering your energy costs at the same time.** The application of the correct refiner plates can help pulp and paper producers in their mill-wide effort of lowering energy consumption, while achieving equal or even better

fiber quality. How do you know which plates to run? ANDRITZ Durametal™ experts help you analyze your process and make recommendations. They can assist you running side-by-side comparison trials to prove the performance.

