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**Andritz News**

Östrand and Obbola to improve environmental footprints with Andritz. SCA chose Andritz Pulp & Paper to deliver a new lime kiln with fuel handling and white liquor filtration equipment for the Östrand mill, and some new recausticizing technology for the Obbola mill, both in Sweden.

The Östrand delivery is part of SCA’s BioLooP project, in which the mill will change its systems from oil to renewable fuels in order to enhance the general environmental friendliness of the mill. The new lime kiln will be fueled by wood dust, which will also lead to lower chemical costs. The scope of supply also includes wood dust burners for the existing power boiler.

The Obbola delivery, for SCA Packaging, will include a LimeGreen™ green liquor filter, a LimeFree™ centrifuge for drugs processing, and a lime mud filtration system. This delivery also includes processes, electrification and instrumentation, as well as modification of the existing control system.

**Forced to focus.**

One thing about a crisis: it forces us to focus on what is most important.

In our personal lives, the serious illness of a loved one snaps our attention to focusing on their care. In our business lives, the crisis of a severe drop in market demand, or wildly accelerating raw materials prices, snaps our attention to what is necessary as the other things are allowed to fall by the wayside.

There are indicators – especially in certain regions – that the worst of the economic crisis is behind us. As the recovery gains momentum, we cannot afford to lose focus.

**Focus on people.**

As engineers, we often focus on technology. But we cannot forget that our technology is created by people, operated by people, and maintained by people. Our focus must be on providing safe, challenging, and rewarding environments for our most important assets.

**Focus on energy.**

Rising energy costs and, more importantly, the security of long-term energy supplies, focus our attention on self-sufficiency, conservation, and alternatives to fossil fuels. Good examples are the Portucel Soporcel Group’s biomass generation projects (page 4) in this issue. And, the energy-saving Ro-Tec Dolphin® rotor used at NSI’s Bruck mill (page 14).

**Focus on efficiency.**

Slashing operating costs and increasing efficiency have been key to survival for most mills. One of the focus areas for efficiency improvements is maintenance. The story about UPM Augsburg’s mill (page 16) tells of a service innovation that saves time and money. An interesting discussion about the role of service (page 22) offers more food for thought.

We have prepared this issue to be distributed at PuPaper in Helsinki – one of the industry’s meeting places. While trade exhibitions are not our major focus, we look forward to every opportunity to meet with customers and discuss solutions for the challenges we all face.
A tale of two mills: bio-generation comes naturally to Portucel

Enerpulp, Portucel Soporcel group’s subsidiary for power production, is taking advantage of available biomass to generate additional “green” revenue for the company at two mills. Two new biomass boilers, recently supplied by ANDRITZ, are performing extremely well according to mill management.

The Portucel Soporcel group is one of Portugal’s largest generators of energy from renewable forest biomass. In the years between 2000 and 2008, the group reduced its fossil CO₂ emissions by 58%. With a focus on renewable energy, Portucel Soporcel group started up two ANDRITZ biomass-fueled power plants (one in Cacia and the other in Setúbal) which produce a net of around 167 GWh/a.

What is unique is that none of the energy generated by the boilers is used by the mills. This is not permitted according to Portugal’s directives for “green energy” credits, so the electricity is sold directly to the national grid.

“Even without these boilers, we are energy self-sufficient at Cacia,” says José Manuel Nordeste, Mill Manager at the Cacia pulp mill. The situation is a bit different at Setúbal, according to Pulp Mill Manager Óscar Monteiro Arantes. “The installation of a new and very large paper machine at our site requires some extra energy produced at a new combined heat/power plant (CHP),” he says. “However, the extra margin we receive for green energy still makes it attractive.”

Ideal locations
The Setúbal site is situated just 4 km from the port town of Setúbal, making transportation of finished goods very efficient. The mill produces 250,000 t/a of bleached pulp (primarily from the preferred Eucalyptus globulus fiber).

Cacia is midway up the nation of Portugal, about 8 km from Aveiro and very close to the sea. “Cacia is in the heart of our country’s eucalyptus forests,” says Nordeste.

“The proximity of this raw material is a key advantage for us.” Cacia’s production of 280,000 t/a is primarily designed for special applications such as décor papers, specially coated papers, and tissue.

“Portucel can actually trace its roots back to the start of the Cacia mill in the 1950’s,” Nordeste says. “By 1957, a team of experts made the Cacia mill a world pioneer with the production of sulphate bleached eucalyptus pulp. Our people have an innovative spirit, combined with knowledge that has been accumulated over decades.”

Value-added pulping + energy
The Portucel Soporcel group is responsible for about 60% of Portugal’s total electricity produced from renewable forest biomass. “Renewable energy is a key focus in the world,” Nordeste says, “and is a major focus for us. It is important for us to be players in this industry to ensure that order is maintained in the market. Forestry resources are our lifeblood. There is a potential threat if we let others control the resource, or simply burn it, before we can add value to it.”

The interest in boiler technology and services has been on the rise in the Iberian Peninsula, according to Anssi Marttila, ANDRITZ’s Pulp Engineered Services Area Manager for the region. “We have worked for many years in cooperation with Portucel Soporcel group on their strategic investments and ongoing service,” he says. “This has given us the opportunity to continuously improve our service and spare parts availability – and to truly have a local presence in Portugal. With abundant resources and the business incentives improving, this will continue to be an active area for us.”

The ANDRITZ biomass boiler project consisted of the supply of two identical boilers with a total production capacity of 49.75 MWth. According to Jukka Kari, Project Manager, the boilers are mid-size (51 t/h, 93 bar, and 472°C). Portucel Soporcel’s scope included the civil/structural work and part of the electrification and automation. “ANDRITZ basically provided everything above the foundations from the fuel feeding conveyor to the main steam header in the turbine-generator plant,” Kari says. Contracts were signed in February 2008 and the boilers were mechanically complete in the fall of 2009.

Value-added at Setúbal
The group has made considerable investments in upgrading the mill in Setúbal, which was originally started up in 1964. Arantes estimates the total recent investment to be EUR 700 million for a new paper machine, new combined heat/power plant (CHP), fibertline and boiler retrofits, and the new biomass boiler.

“We started up the boiler without difficulty. There is good flexibility to burn different biomasses with different moistures.” Óscar Arantes, Pulp Mill Manager, Setúbal

Arantes (left) with José Henriques of Exporatlas, ANDRITZ’s agent in Portugal.
Portucel Soporcel Group

One of the strongest references for ANDRITZ was the new recovery boiler they installed at this mill in 2006. This recovery boiler works perfectly – like a Swiss watch!

José Nordeste, Mill Manager, Cacia

Standing in front of the new Cacia biomass boiler are (left to right) António Gomes, Site Project Director, José Henriques, ANDRITZ agent, and José Nordeste, Cacia Mill Manager.

“We use about 150,000 t/a of biomass as a fuel here at the mill,” Arantes says. “About eighty percent of our logs are debarked before entering the mill. We use special harvesting and binding equipment to gather forest waste and put it into small bundles for transport.”

In addition to providing green energy, the removal of forest waste has another large benefit: a reduction in forest fires. “In the summer, this region is hot and dry, which increases the risk of forest fires considerably,” Arantes explains. “By removing the waste from the forest floor, we actually reduce the risk and impact of fires. We do not remove everything however. Our forestry experts know well where they can remove biomass without damaging the soil.”

As for the boiler itself, Arantes has this to say: “ANDRITZ kept all the contract milestones on-time or ahead of schedule. We started up the boiler and the start-up was without difficulties. It went into service quite smoothly, which is a good indication of the cooperation between ANDRITZ and our own project team. The design of the boiler is good. There is good flexibility to burn different biomasses with different moistures.”

Recovery boiler retrofit

An ANDRITZ recovery boiler installed at Setúbal in 1990 was due for a retrofit. Portucel Soporcel group decided to have part of the boiler bank rebuilt, in addition to replacing portions of the economizers and a portion of the superheater for this 2,200 tds/d unit. ANDRITZ won the bid.

With annual production capacity of 1.55 million tonnes of paper and 1.35 million tonnes of pulp, the Portucel Soporcel group is the European leading producer of Uncoated Woodfree paper, as well as the largest European producer of bleached eucalyptus kraft pulp.

The group has three mills in Portugal: Setúbal, Figueira da Foz, and Cacia. The origins of the group date back to the 1950’s at Cacia producing raw pine pulp. In 1976, Portucel (Empresa de Celulose e Papel de Portugal) was incorporated as a result of the nationalization of the cellulose industry. With a view to restructuring the paper industry, Portucel acquired Papéis Inapa in 2000 and Soporcel in 2001. In 2004, Sempapa of Portugal acquired a majority stake of Portucel.

Over the years, the group has pursued a strategy of developing its own brands, including Navigator, which is the world’s best selling brand in the premium office paper segment.

Thanks to the use of renewable forestry biomass fuel, Portucel Soporcel group is Portugal’s leading producer of energy from this source.
“This was a large retrofit project,” says Timo Lamberg, Project Manager for ANDRITZ. “We installed 856 new tubes in the boiler bank, and both the first and second economizer sections.”

The economizer sections were massive, about 25 m high and weighing 22 t per assembly block. “In order to dismantle the very large sections and put in the new ones, we had to rent one of the largest construction cranes in the region, this one coming from Spain,” Lamberg says.

Shutdown for the retrofit work began in October 2008 and the recovery boiler was commissioned in November.

Excellent reference at Cacia
The recovery boiler at Cacia also played a key role in deciding the biomass power boiler project for ANDRITZ, according to Nordeste.

“One of the strongest references for ANDRITZ was the new recovery boiler they installed at this mill in 2006,” Nordeste says. “We would not be able to make the other improvements to the fiberline and the rest of the mill without this boiler operating well, as our two old units were at end-of-life. This recovery boiler works perfectly – like a Swiss watch!”

“You can make big mistakes in handling and burning eucalyptus bark,” Nordeste says. “It comes in long, stringy strips and must be cut correctly. Our first biomass (bark) boiler started in 1987, so it is nothing new to us.”

Another challenge is that the mill never knows what it is receiving with the biomass, according to Antonio Gomes, Site Project Director and now the mill’s Production Manager. “We see all kinds of incoming contaminants in terms of metals, concrete, and other things,” he says. “You need a very robust and reliable boiler system to handle it.”

“We see all kinds of contaminants in the incoming biomass. You need a very robust and reliable boiler system to handle it.”
Antonio Gomes, Site Project Director

Shutdown for the retrofit work began in October 2008 and the recovery boiler was commissioned in November.

MILL SITE
CACIA, PORTUGAL

Portucel Soporcel group

“Soft Sensors” and a New Way of Seeing
The Cacia power boiler utilizes a new diagnostic tool introduced by ANDRITZ. Linked via a remote connection to the mill’s distributed control system, ANDRITZ specialists take measurements and create a database of trends in order to optimize the boiler’s performance.

Heikki Lappalainen, Product Manager for Automation and Diagnostic Applications in Varkaus, Finland, explains: “In a Formula One race, the crew takes measurements of speed and time and combines this with their knowledge to determine when to bring the car in for fuel, tire changes, or other adjustments. We do that with production equipment.”

The unique service from ANDRITZ combines actual measurements with expert knowledge to arrive at what Lappalainen calls “soft sensors” – predictions about fouling degree, efficiency, or other factors. “If Portucel Soporcel wanted us to, we could use the computer system to predict and give them guidance when to bring their boiler in for a pit stop,” he says laughing. “Another way to say that is we can predict the optimum time between shutdowns, or how to operate the boiler most effectively until a planned shutdown.”

These are not short-term, operational predictions, but rather longer term trends. “We collect data for three to six months to build a database,” Lappalainen says. “Then, working with the customer, we can focus on one piece of equipment (such as the power boiler) or one particular situation. The focus at Cacia now is how to optimize the heat transfer from flue gas to steam.”

ANDRITZ provides remote diagnostics for boilers, digesters, bleaching systems, and other production equipment. “Mills operators optimize day-to-day and handle the hour-to-hour situations,” Lappalainen says. “We look at longer term optimization and give the operations people some new tools.”
A project under lucky stars

The timing of Yueyang Paper Co.’s new mill in Hunan Province was excellent. At its start, Yueyang took advantage of lower commodity costs and a favorable currency exchange rate. After start-up, financial pessimism in China diminished and the market is recovering nicely. “Honestly, we have been really lucky,” says Guo Yongwei, Chief Engineer.

Yueyang Paper Co., a member of the Hunan Tiger Forest & Paper Group, placed an order with ANDRITZ PULP & PAPER for a complete deinking line, stock preparation systems, and paper machine approach systems for their new mill in April 2008.

The fiber preparation technology prepares quality stock for two new 5.3 m wide paper machines at the mill producing environmentally friendly copy paper and premium offset printing paper. The furnish is a combination of deinked mixed office waste (MoW), mechanical pulp, and bleached Kraft. In addition to the technology, ANDRITZ delivered control engineering, erection supervision, and start-up services.

Start-up of the production lines took place in July 2009. The new PM10 started operation in August. Currently, PM10 is being fed an 80:20 mixture of deinked pulp (DIP) and bleached softwood Kraft. The deinking line cleans and brightens American sorted office paper and local office waste paper to about 82% ISO brightness.

The bleached Kraft comes to the mill from parent company Tiger Forest & Paper, or from the market, depending on which is the most cost-efficient. ANDRITZ provided all the major production systems for Tiger’s 400,000 t/y chemical pulp mill in Huilhas City, Hunan province (see story in SPECTRUM No. 19/1-2009). In addition, Yueyang Paper can also use high quality mechanical pulp from a 200,000 t/y mill in Hunan province, the site of ANDRITZ’s first P-RC APMP line in 2003 (see story in Issue 2/2004 of FiberSpectrum) instead of bleached Kraft.

The second machine, PM9, is furnished with a 70:30 mixture of bleached hardwood and softwood Kraft pulps. ANDRITZ also provided stock preparation equipment and approach systems that refine BSK and BHK, and prepare the stock for the two PMs.

“Generally speaking, the whole process from technical negotiations and international bidding to erection and commissioning went quite smoothly,” says Guo, who is also the Administrative Vice Commander of the Yueyang Paper and was the project director during construction. “This all was realized even though the project time was short.”

“Most important part of the whole project”

“Generally speaking, the DIP line is the most important part of this total project,” says Zhou Xunfu, Project Manager of the DIP project. “The runnability of the line and quality of the deinked pulp is critical for the paper machine. For this reason, ANDRITZ is a very important partner.”

Zhou notes that the line is “extremely easy to operate. We were able to make quality pulp from the start-up and we only need four operators per shift to run the entire line. The operating efficiency is really high.”

According to Zhou, the equipment has been running well since start-up in the summer of 2009. The guarantee run was completed in March 2010, and customer takeover of the entire line occurred April 1, 2010. “Despite some minor problems at start-up, we would already rate the system as perfect,” Zhou says. “The quality of the pulp helps us meet all the requirements of PM10 and the older paper machines. The ANDRITZ team has been patient and dedicated. For me, it has been truly a pleasure to listen, learn, and even challenge their expertise.”

ANDRITZ delivered totally three SelectaFlot flotation stages to obtain maximum final pulp quality.

ANDRITZ PULP & PAPER supplied a complete deinking line, stock preparation systems, and paper machine approach systems for Yueyang Paper’s new mill.
Liu Yawei, Vice Director of the DIP Department, has similar feelings. “Based on the way the line is running now, we are confident of success in the performance test. We know that, under the supervision of ANDRITZ experts, we can achieve all the guaranteed performance very soon.”

“A fantastic group to work with!” “Yueyang really has a nice team here,” says ANDRITZ’s Friedrich Hoppl, the on-site leader of the start-up team. “Friendships have been developed, not only professional, but personal ones. They are more than customers. I would say that we are colleagues. All the time we keep open communications and dialog.”

Chen Zuqing, the Project Manager for the DIP plant from ANDRITZ China, also remarked about the excellent cooperation. Chen was responsible for overseeing the locally manufactured equipment, while his colleague, Gerhard Knes from Austria, was Project Manager for the engineering and imported equipment.

“I feel that the confidence, comradeship, and expertise we have at ANDRITZ most certainly can be seen and felt by the customers,” Chen says. “This leads to progressive and efficient operations, no matter how challenging.”

The choice of ANDRITZ “Why did we choose ANDRITZ as the supplier for our new deinking system?” asks Guo. “First, it is supplying the most advanced technology for deinking systems with references around the world. I visited the deinking line for our customer Shandong Chemming, as well as the mill in Jiangxi Chemming, where the DIP line is more or less the same that we wanted to build. These installations really gave us a good impression.”

“The technology, the R&D ability, and the equipment manufacturing capacity of ANDRITZ met exactly the requirements of Yueyang Paper. And finally, ANDRITZ could offer a really nice price-to-performance ratio. “Based upon the project and the performance, we made the right decision.”

A new project already in plans “We are already planning a 500,000 t/y increase in our production,” Guo says. “At the present, we are confirming the technical concept for the project and making the general layout. Our longer range plan is to build this mill to a basis of 1.5 million t/y papermaking capacity.”

He also hopes that also ANDRITZ continues its R&D work in energy savings. “Savings in power, steam, and water consumption really help the industry reduce costs, and make our products more competitive in the market. Another consideration for us is how to further reduce effluents and emissions. The Chinese government is getting stricter and this brings a lot of pressure to pulp and paper companies.”

In China, the older standards for effluent measured four variables. The new standard has grown to eight items. “There are differences in the COD concentration,” Guo says. “The old standard was 410 ppm (parts per million). Then it was reduced to 150 ppm, and it will be further reduced to 80 ppm in the standard that goes into effect in 2011.”

Nearly 20 years of cooperation with ANDRITZ Guo says that he has been cooperating with ANDRITZ since 1991. “The first project I was involved in was the first poplar APMP line,” he says. “Notably, it was the first APMP line in China.”

ANDRITZ sent an expert from their laboratory in North America to Yueyang Paper. “He worked here with us until we found the roots of the problems and solved them completely,” Guo says. “Thanks to this improvement, we were awarded second prize by the National Scientific and Technological Progress.”

Much hope on green paper production According to Yueyang, using recycled deinked pulp for high-grade copy paper production is a big challenge in China. “We are applying for a certificate for green products from the State, as we are using deinked pulp for high-grade environmental-friendly copy paper,” Guo says. “We can also use the green paper concept in marketing, but the technology needed for green paper is very high, it is a real challenge.”

Overall, Guo and Yueyang Paper are extremely satisfied with the project. The ANDRITZ line is running smoothly, and it needs less operators. “It will be really nice as we control the consumption of energy, water, and raw materials as per design in the near future.”
Dolphin-assisted therapy for screens

Moving to 100% recycle for newsprint presented challenges for the Bruck mill’s DIP department. The mill teamed with ANDRITZ Fiedler to meet these challenges. Improvements in cleanliness, runnability, and energy consumption have been above expectations.

“A at the end of the day, the paper machine is our best online measurement tool. The improved runnability of the paper machine is our best proof of success.”

Peter Nuspl, Technology Pulp

Excellent results at a glance: viewing handshakes after screening – before (top) and after the screen basket/rotor change.

A challenge for the DIP team

Primary drivers for the decision were cost and quality. Today it is possible to run 100% deinked pulp on PM3. “The quality requirements are set by the paper machine,” says Peter Nuspl, Technology Pulp. “Then, we on the fiber processing side have to decide how best to meet these requirements.”

“It was a major challenge for the DIP team,” says Patrick Wohlmuth, Assistant Pulp at Bruck, who is responsible for the fiber processes in the denking lines.

Coarse screening in need of therapy

The three-stage coarse screening system in the DIP plant was a challenge due to the stickies that were passing through. “We contacted ANDRITZ Fiedler because of their experience and reputation in screening,” says Wohlmuth.

Uwe Wolf, a Regional Product Manager at ANDRITZ Fiedler, explains the overall goal.

“We know from experience that effective screening is the right combination of screen basket and the rotor. It is not enough to have the right slots and profile in the basket. The rotor and basket work as a team.”

The first step was to introduce the new Bar-Tec® Rejector screen basket to the Bruck mill. “The new screen basket removes impurities already in primary screening,” Wolf says, “thanks to its special profile wire and a diagonal slot geometry. This puts less demand on the downstream screening stages.”

Wohlmuth and his team at Bruck installed one trial Bar-Tec® Rejector basket in DIP Line 2 to see how it would work. This single replacement of an existing drilled basket reduced impurities by 32% and increased the removal of stickies by 23%. Based on this trial, Bruck ordered the replacement of the existing drilled baskets in all the coarse screens for DIP Line 1.

First test on a three-stage system

“We had only tested the Bar-Tec® Rejector basket in single installations at several mills,” Wolf says. “But Bruck would be the first attempt at equipping a complete screening stage with the new design.”

“There is always some degree of risk when you install any new technology,” Nuspl replies. “But we were confident that ANDRITZ, and especially Uwe Wolf, would meet this challenge since we have done several projects together.”

Dolphin-assisted

To optimize the performance of the new basket, ANDRITZ Fiedler recommended combining it with the new Ro-Tec Dolphin® rotor. Innovative R&D led ANDRITZ to create a unique rotor with foils that resemble the nose of a dolphin. This rotor is proving itself successful in nearly 100 installations around the world – improving screening capacity and dramatically reducing energy consumption.

So in August 2008, the combination of Bar-Tec® Rejector screen baskets (slot width 0.40 mm) with Ro-Tec Dolphin® rotors were installed in the first and second stages of coarse screening at Bruck. They replaced drilled baskets (hole diameter 1.8 mm) and the original rotors.

“With two new baskets and rotors, a good portion of the impurities was removed,” Wohlmuth says, “but the vibration screen in the third stage had serious quality problems.” Bruck removed this screen in March 2009. It was replaced by a spare pressure screen which was equipped with the Bar-Tec® Rejector/Ro-Tec Dolphin® combination.

The proof is on the machine

The coarse screening at Bruck improved far beyond expectations. The effective stickies removal is much higher than the 50% guaranteed value – and at the same throughput, energy consumption has been reduced by 10%. “Our requirements regarding stickies and energy were completely fulfilled, and the maintenance and cleaning intervals of the screening line have remained the same,” says Wohlmuth.

On the paper machine side, downtime for cleaning the wet end and for paper breaks caused by stickies have been reduced by 10-15%. “At the end of the day, the paper machine is our best online measurement tool,” says Nuspl with a smile. “The improved runnability of the paper machine is our best proof of success.”

“Our requirements regarding stickies and energy were completely fulfilled, and the maintenance and cleaning intervals of the screening line have remained the same.”

Patrick Wohlmuth, Assistant Pulp

Roland Magerböck, Bruck’s Maintenance Project Manager, had the task of layout and dimensioning of piping for the three-stage screening system.

Patrick Nuspl (left) and Patrick Wohlmuth (center) of Bruck talk with Uwe Wolf of ANDRITZ Fiedler beside a Bar-Tec Rejector screen basket.
The old way of changing out filter bags a few at a time by shipping segments back to a supplier is time-consuming, slow, and expensive. ANDRITZ developed a new solution – the Mobile Filter Bag Exchange Unit – which comes right into the mill. When UPM Augsburg was faced with the major task of changing out all the filter bags on five disc filters at once, it seemed an opportune time to try ANDRITZ’s new solution.

**End-of-life**

A disc filter is a slurry-filled tank with a rotating horizontal shaft inside. Mounted on the shaft is a row of discs. Each disc is made up of individual segments which are covered with a woven material. This covering is known as a filter bag. The filtration process is continuous. As each segment is submerged in the slurry, vacuum is applied, which pulls the liquid in the slurry through the filter bag and into the segment. The liquid filtrate is removed from the segment and solids form on the surface of the filter bag. The solid cake dries and is removed from the filter bag as the disc rotates and the cycle starts again. This continuous action wears out the filter bags over time.

In total, the five ANDRITZ disc filters at UPM Augsburg have 1510 segments – which means 1510 filter bags. Normally, a filter bag has a useful life of four to five years, depending upon the application. At Augsburg, however, the filter bags were made of a temperature-resistant Kynar® polyvinylidene fluoride, which in the company’s experience could achieve an up to nine-year life. Even so, the filter bags were now at their nine-year limit. As Fiber Production Manager Wolfgang Krodel explains: “Through regular inspections, we knew that most of the filter bags had come to the end of their useful life. Dewatering performance of the disc filters was deteriorating to such an extent that the bags needed to be replaced."

**Flying Box vs. Mobile Exchange Unit**

In many mills, the filter bag changeout process consists of a supplier sending the mill a “Flying Segment Box” containing up to 20 filter segments with new filter bags installed.

The paper mill in Augsburg was established in 1849 and became a part of UPM in 2001. The mill produces up to 530,000 tonnes of uncoated and coated papers for rotogravure and web heatset offset printers on two paper machines.

The Augsburg mill utilizes five ANDRITZ disc filters: three for dewatering in the DIP plant and two as saveall fiber recovery units at PM3, a 9.6 m wide modern machine for the production of LWC grades. The DIP plant furnishes both paper machines and was started up together with PM3 in 2000.

**Disc filter segments with new filter bags installed.**

**Mobile filter bag exchange: high-speed disc filter maintenance**

The mill then removes an equal number of segments that are damaged or need new filter bags from their disc filter and ships these back to the supplier in the same Flying Segment Box. This exchange goes on until all the filter bags are replaced. As you can imagine, this can be a costly and time-consuming process: packing, unpacking, shipping both ways, waiting. It is accepted for small segment repairs or filter bag replacements on a one-by-one basis.

Given the situation of 1510 replacements at UPM Augsburg at the same time, the Flying Segment Box approach was not going to be possible. At 20 units per box, this would require 76 boxes to be shipped. So, alternatives were considered.

“Their timing was excellent, because we had been experimenting with this Mobile Filter Exchange concept internally,” says Jürgen Hirschberger of ANDRITZ. Hirschberger
Markus Grimm, Fiber Production Superintendent at UPM Augsburg.

“...the idea behind the Mobile Filter Exchange is quite simple,” Hermann says. “The unit containing our machines and tools is actually quite compact. We bring it to a mill site, set it up, and are ready to go into continuous production. We reduce maintenance and shipping costs quite a lot and the customer gets significant increases in equipment performance right away after a shutdown because all the filters are refreshed.”

Although ANDRITZ supplied the original disc filters to UPM Augsburg, this was not the deciding factor for their selection. The service team presented the Mobile Filter Exchange concept for handling this large maintenance task in an efficient way. Based upon experience, UPM Augsburg believed in the ANDRITZ approach. “We would not have the confidence to go through with a campaign like this with just any supplier,” Krodel says. “With ANDRITZ, we chose the right partner.”

Putting a plan into practice

At the end of 2009, the ANDRITZ service team received the order and moved into action. The mill had the following expectations: it was highly likely that the ambitious goal of completing maintenance work on all 1150 segments within a single, tightly scheduled shutdown would not be possible. So, the target was to change out enough disc filter bags during the shutdown to at least be able to run the DPI plant and the paper machine afterwards.

ANDRITZ project managers Hirschberger and Hermann drew up a plan to perform the work during two time slots, with the ambition of carrying out the work during one shutdown only. If that were the case, the service team from Graz would only have to make one trip to Augsburg.

It took about one month to design and test the Mobile Filter Bag Exchange Unit. The line was tested at ANDRITZ’s facility in Graz, Austria and service people simulated the sequence of disassembly, cleaning, installation, and reassembly to determine exactly the time schedule and number of people required for the job.

Then the special challenge: coordinating the work within the very tight schedule specified by the shutdown. The disc filters are part of two different lines (DIP and PM3), which had staggered shutdown periods. The paper machine was shut down first and the ANDRITZ team began work on the two savalle disc filters.

Twenty-four hours later, the DPI line was shut down, and the service team moved its mobile assembly operation to complete as many disc filter segments as possible in the remaining 36 hours of the shutdown. Then, the DPI line would go back in operation to supply stock to PM2, which had continued production. After this, work was resumed and completed at PM3.

Four filters, 1260 segments, 50 hours

ANDRITZ succeeded in replacing filter bags on four of the five disc filters – a total of 1260 segments – within 50 hours. “This has to be a maintenance record,” says Krodel. “I cannot think of there ever being such a non-stop replacement campaign of this scale anywhere within UPM.”

According to Krodel, the main concern was to complete the work on the two savalle disc filters with PM3 and two of the three filters in the DPI plant (loops 1 and 2) in time so that the mill could resume production. Changing of the remaining 250 filter bags on disc filter 3 (used in the third loop of the DPI plant for removing impurities from the preceding bleaching stage) was scheduled for the Christmas shutdown.

All involved in this unique maintenance project had positive impressions from the experience. Hirschberger praised the close cooperation with colleagues at Augsburg. “Bernd Schindler, Engineering Manager at ANDRITZ, an experienced hand in the field, made sure that we had everything at the ready: electricity, compressed air, steam, machine room crane, lifting platform, and so on,” Hirschberger says. Markus Grimm, Fiber Production Superintendent at UPM Augsburg, says that filtrate from the disc filters in the DPI plant now contains only 100 mg solids per liter, where this figure was 1000 mg/l with the old filter bags.

Hermann says, “Non-stop changing of the filter bags on this scale was certainly a first for ANDRITZ. We learned a great deal about how to operate the Mobile Filter Bag Exchange Unit and we are ready for the next challenge.”

The solids content in the filtrate from the DPI plant is now one-tenth of what it was with the old fiber recovery filters.” Markus Grimm, Fiber Production Superintendent at UPM Augsburg.

The mobile exchange concept was such a success that ANDRITZ plans to use it at other mills in the future. “We are well-equipped for prompt repairs to disc filters,” Hermann says. “The unit itself is small and our people are very mobile. We are ready and waiting for our next assignment.”

ANDRITZ project managers Hirschberger and Hermann drew up a plan to perform the work during two time slots, with the ambition of carrying out the work during one shutdown only. If that were the case, the service team from Graz would only have to make one trip to Augsburg.

It took about one month to design and test the Mobile Filter Bag Exchange Unit. The line was tested at ANDRITZ’s facility in Graz, Austria and service people simulated the sequence of disassembly, cleaning, installation, and reassembly to determine exactly the time schedule and number of people required for the job.

Then the special challenge: coordinating the work within the very tight schedule specified by the shutdown. The disc filters are part of two different lines (DIP and PM3), which had staggered shutdown periods. The paper machine was shut down first and the ANDRITZ team began work on the two savalle disc filters.

Twenty-four hours later, the DPI line was shut down, and the service team moved its mobile assembly operation to complete as many disc filter segments as possible in the remaining 36 hours of the shutdown. Then, the DPI line would go back in operation to supply stock to PM2, which had continued production. After this, work was resumed and completed at PM3.

Four filters, 1260 segments, 50 hours

ANDRITZ succeeded in replacing filter bags on four of the five disc filters – a total of 1260 segments – within 50 hours. “This has to be a maintenance record,” says Krodel. “I cannot think of there ever being such a non-stop replacement campaign of this scale anywhere within UPM.”
The mobile assembly line concept was developed and tested in Graz. UPM Augsburg became the first mill site to use the mobile exchange and was very successful. The Mobile Filter Bag Exchange Unit consists of the following stations:

1. Disassembly and inspection of the disc filter segments (with special equipment and tools for disassembly)
2. Removal of the old filter bags and cleaning of the segments with steam (cleaning booth)
3. Repair of damaged segments (welding equipment, etc.)
4. Installation of new filter bags
5. Shrinking the bags on the segments to fit (mobile shrinkage oven that holds 40 segments at a time)
6. Mounting of seals and reinstalling the segments in the disc filters
7. Inspection of the assembled disc filter unit

The proven Mobile Exchange Unit concept and our excellent team are ready to set a further maintenance record – also in your mill.
“New solutions are crucial…”
The worldwide economic crisis has made a huge impact on all of us. We recently talked with customers about how the crisis is forcing businesses to change – and what is required of suppliers now.

It appears that in this new economy, the focus in the Pulp & Paper industry goes beyond about how to produce the best product – and now considers how to swiftly adjust production, manage inventories, change grades, accommodate lower-quality fibers, save energy, etc. In other words, how to survive in a rapidly changing world. Part of that survival is the reduction of operating costs and attempted improvements in efficiencies without the luxury of large capital investments. Two recent discussions with customers – Jorma Latva-Kokko of Metsä-Botnia – show us how quickly this business changes!

Hit extremely hard

“While the industry should be preparing for an upswing, the storm has not settled yet,” Bachhofner says. “Regrettably, this means that further mill closures will occur. After this is all done, it will be clearer what we need to concentrate on.”

According to Latva-Kokko, the measures depend on each individual mill and its long-term potential. “We need to ask ourselves if we really need all the process stages, and do we need to be as thorough as before? This is how the industry has developed over decades. These are the types of questions that we are dealing with today at Stora Enso.”

“Since we have been pushing to deliver simplified and standardized products,” Bachhofner says. “Perhaps now these will have more appeal. There are many opportunities in sourcing and manufacturing which were not available even 10 years ago.” He cites the standardization ANDRITZ is achieving in service and engineered wear products as examples. Of special note are the SMART line of standardized parts (pulp screen plates, screw press baskets and shafts, etc.) which have excellent quality and are manufactured in a standardized way to reduce component costs. “Standardization has cost benefits down the line,” Bachhofner says. “Smaller spare parts inventories, standardized maintenance procedures, easier changeouts.”

More mill closures, less capital

“Energy is the most important aspect of all our mills,” Latva-Kokko says. “How to get it at a reasonable price, and how to ensure that it is used in the most efficient way.”

However, he admits, more accurate information is needed. “There is good knowledge on how to more efficiently consume energy in our processes,” Latva-Kokko says. “But where we are lagging is that we do not know exactly how to change our energy consumption patterns, especially in mechanical pulping. For example, only 10-20% of the energy for TMP goes into the actual fiber treatment – the rest is heat and waste. We have not progressed to the point where we can increase energy efficiency to 50% for example and how to avoid wasting this energy. We need to know exactly how much energy is needed for a specific product, and how we can use it efficiently.”

Bachhofner warns against expecting a single solution to dramatically improve energy efficiency. “It is a combination of technologies and processes tailored to each mill,” he says. “For example, chip pretreatment, using LC refiners in secondary and reject positions, adding low-energy Duramental® refiner plates, replacing old rotors in the screencom with energy-saving Dolphin® rotors, and a host of other things.”

He also suggests that maybe the solution is to find out which fiber properties are needed for a specific paper type. “Defining is usually done to a certain average value,” Bachhofner says. “Perhaps one does not need all the strength values that are put into the average production.”

Can we still be partners?

“Much of what we are doing today is rather short-term in order to survive,” Latva-Kokko says. “This affects the suppliers as we are buying less but expecting closer partner- ship with suppliers like ANDRITZ. We are now cash-strapped, but someday we hope to maximize the mill’s productivity and minimize costs.

“Botnia and ANDRITZ found several areas to develop cooperation,” explains Harri Qvintus, ANDRITZ Senior Vice President responsible for Pulp Engineered Services in Northern Europe. “This has the involvement and commitment of Botnia’s top management. They set the targets for the organization.”

“About two years ago, we started OPE® at the Äänekoski mill to save energy and chemicals in the kraft fiberline,” says Ilkka Poikolainen, Production Manager. “It has been a fruitful cooperation. For example, in the winter our bottleneck has been digester runnability due to insufficient chip presteaming. ANDRITZ suggested small improvements and utilized their simulation program to solve the majority of our problems. Not much capital was employed. We accomplished this even though we have raised the capacity of this mill about 60% from when the line was built in 1985.”

Another continuously developing area is cost efficiency. The wood raw material costs are the major variable costs in pulping. “So we have an ongoing project to increase the yield,” he says. “Together with ANDRITZ we are trying to optimize the digester to find the best solution.”

Botnia is also working with ANDRITZ to fine-tune the equipment to avoid disruptions and unplanned shutdowns. “Each shutdown costs us dearly,” Poikolainen says. ANDRITZ is also working in the mill’s recaustizing area to reduce losses.

“We continuously check our costs,” says Poikolainen. “We have in-depth cost accounting, so we know that OPE® is delivering bottom-line results. ANDRITZ’s knowledge of processes and equipment is combined with our intimate knowledge of this mill to the benefit of both companies. At Botnia, we focus on improved pulp quality at lower costs. ANDRITZ has the same focus even when there is not a large capital project on the horizon.”

“This year we have focused on making the best possible paper. Now there are new challenges.”

Jorma Latva-Kokko, Manager for Furnish Solutions, Stora Enso Publication Papers

“The storm has not settled yet.”

Thomas Bachhofner, Senior Vice President, Paper Engineered Services

“Both partners are seeking to maximize the mill’s productivity and minimize costs.”

Harri Qvintus, Senior Vice President of Pulp Engineered Services, Northern Europe (picture left)

“It has been a very fruitful cooperation.”

Ilkka Poikolainen, Production Manager at Botnia’s Äänekoski mill
Narrowing the gap in Lucca

Italian producer Cartiere Modesto Cardella is first to install a new gap former for packaging grades from ANDRITZ. The investment positions Cardella well as the market demand for lightweight corrugating medium increases.

“When market demand starts to increase for under 100 g/m² basis weight medium, we’ll be ready to cater to it.”

Modesto Cardella, Managing Director and Member of the Board

One part of this story began in March, 2008 when Cardella commissioned ANDRITZ PULP & PAPER to supply a new two-layer PrimeForm TW headbox with PrimeProfiler F consistency profiling and a PrimeForm TW gap former. ANDRITZ also modified the pickup suction roll framework and did the basic engineering for the approach flow and whitewater systems.

But, according to Mario Cardella, Chairman of the mill’s board and Modesto’s father, the story actually began in 1977, the year PM4 was built. “In the mid-1990s, PM4 was no longer able to deliver the formation and profile the market required for top-quality paper,” Mario says. “So, in 1995 we renovated the machine, which also set the stage for future investments.” Today, PM4 has a design speed of 1,200 m/min and a wire width of 3.18 m. Containerboard with a 90-170 g/m² basis weight range is produced from 100% recycled fiber.

“It is not our style,” says Modesto, “to routinely make changes to our equipment, but rather to focus on projects that will last for years to come. That is why we made the investment in the PrimeForm TW gap former.”

A question of lightness

The strategy behind the investment is to enable the Lucca papermaker to meet the demands of a newer European market trend – basis weights below 100 g/m². In a gap former, the jet generated by the headbox is directed into the narrowing gap between two forming fabrics. Water is removed in both directions, which tends to produce a sheet in which the fines content and appearance of the two sides is very similar. Because the sheet becomes “set” very rapidly within a gap former, the uniformity of the jet from the headbox is critical.

“The installation of a two-layer headbox and the gap former is a big step that permits PM4 to manufacture paper in a style unattainable before,” Modesto says. “On our smaller PM3 machine, we will continue to produce a product consistent with the standard requirements of the Italian market. So with the two machines, we are ready to supply virtually any type of demand.”

Careful consideration

Once the strategy and goals were set internally, Cardella needed to decide which suppliers to involve any type of demand.”

“We achieve the very best mechanical paper properties and excellent uniformity.”

Andrea Moretti, Mill Manager

The gap former parameters are currently being optimized on PM4, but already the machine is producing a 100 g/m² sheet at speeds above 800 m/min and is being ramped up toward its maximum design speed of 1,200 m/min. “Very definitely over and above our expectations,” Modesto reports. “We are very satisfied.”

“And we are discovering the characteristics of the machine,” says Andrea Moretti, Manager of the San Pietro a Vico mill. “One month after start-up we are performing paper tests in cooperation with ANDRITZ. We are intent on discovering all the nuances that the gap former is contributing to our production process. Thus far, we have seen that when we are running under stable operating conditions, we achieve the very best mechanical paper properties...
and excellent uniformity. Before the gap former, there were considerable variations. Still, it is a bit too early to talk about performance levels.”

More to explore
The PrimeForm TW is smoothing production of the entire line because there are less parameters to be kept under critical control. Mario Cardella explains: “The whole line is more stable in that it is less sensitive to fluctuations of whatever enters the machine. With the web being built by centrifugal force – and centripetal force in the first section – the machine is less affected by variations in the furnish or by operator actions. Even though we have not yet assessed all the improvements the gap former will enable us to achieve, we know, for example, that there has been no increase in power consumption. This development is very promising, but we will only be able to talk about real energy savings once we have maximized the use of all the various instruments.”

Exchanging ideas
The Lucca installation has turned out to be a great training experience for the supplier as well. “There has been an exchange of information helpful to both parties,” Modesto says. “We were very demanding, often for our own sake, but we will only be able to talk about real energy savings once we have maximized the use of all the various instruments.”

“Working with ANDRITZ was a positive experience from all points of view,” says Moretti. “We were also pleased with the technical training received by our personnel.”

What would Cartiere Modesto Cardella do differently if it could turn the clock back? “Nothing,” concludes Modesto Cardella. “We are more than satisfied with our experience and are very pleased to have had the chance to work on this project together.”

Today, Mario is Chairman of the Board and has been joined by his children Modesto, Rosana, and Cristiana, all of whom are board members. The mill produces paper for corrugating machines, with a total potential capacity of 170,000 t/a. PM3 has a working width from 2.5 to 2.55 m and the width of the new PM4 is 2.65 to 2.8 m. About 80% of sales stays in Italy, while the remainder goes primarily to the Mediterranean Basin.

Cartiere Modesto Cardella was the brainchild of four Italian brothers – Francesco, Modesto, Pasquale, and Giovanni Bernardi. In 1946, they opened the mill at San Pietro a Vico (Lucca). In 1953, Modesto became the sole owner and began implementing an investment strategy which continues to distinguish the firm.

In 1966, after Modesto died, his son Mario took over, carrying on his father’s work and continuing to reinvest profits. In 1977, the new PM4 was installed. In 1995, both production lines were revamped.

In March 2008, Cartiere Modesto Cardella selected ANDRITZ PULP & PAPER to supply a two-layer PrimeFlow TW headbox with PrimeProfiler F dilution control and the PrimeForm TW gap former. The wire width is 3180 mm and the equipment is designed for a maximum speed of 1,200 m/min.

ANDRITZ also modified the pickup suction roll framework on PM4 and did the basic engineering for the approach flow and whitewater systems.

Headbox. The PrimeFlow TW headbox gives paper producers the opportunity to efficiently use different raw materials to create the ideal sheet in terms of mechanical strength, optical appearance, etc. A stiff lamella separates the individual layer flows in the nozzle. The lamella is rigid to permit operators to run two different layer jet speeds – giving an opportunity to custom-tailor paper properties.

Profiler. The well-proven PrimeProfiler F consistency profiling system ensures the best possible basis weight profiles.

Gap Former. The newly developed PrimeForm TW for packaging grades enables the production of containerboard in a range of 90-160 g/m². The former minimizes two-sidedness and maximizes sheet dewatering. Forming shoes on both the top and bottom provide uniform dewatering within a wide operating range.
Thanks to the tight control of kiln temperatures and excess oxygen provided by KilnACE®, Mondi SCP has significantly reduced purchased lime and has reduced specific energy consumption. Here, Vladimir Krajci inspects the firing end of the kiln.

Mondi SCP’s mill in northern Slovakia is in harmony with nature – nestled among mountains, rivers, and the small community of Ružomberok.

From the top of a recovery boiler, you can get a sweeping view of a mill’s operations. At Mondi SCP’s mill in Slovakia, you get something more: a view of the Váh River running alongside, ski slopes and snow-capped mountains on the horizon, and the town of Ružomberok surrounding the site. This mill is truly embedded in the community – and in harmony with the surrounding natural beauty.

Surprisingly, what you don’t see from the recovery boiler is the lime kiln. You would think it would be easy to spot a 100 m long rotating cylinder. Where did it go?

“It’s right here,” says Vladimir Krajci, Recovery Line Manager, pointing to a roof-covered structure. It is just very unique.” Krajci explains that the old kiln is “part Russian style, part Western style” and that he has never seen another kiln like this one. One part of the “Russian” contribution was the full-length roof which shields the kiln from view. The “Western” contribution is the firing end and flue gas recirculation system.

Nothing more to do mechanically
The kiln had become a big bottleneck for the operators at Ružomberok. Through technical improvements and changes in operating procedures, it had been coaxied from its original 250 t/d rating to 350 t/d – on a good day. However, dusting, plugging, and near-constant ring formations led to a production curve that resembled a yo-yo.

“We have five shifts, which means five operators,” says Peter Scholtz, Recovery Line Production Manager. “One operator would adjust the feed end temperature to avoid plugging. After the shift change, the next operator would see rings forming and would have to take the kiln offline for a few hours to blast the rings. The next operator would over-adjust excess oxygen, and the next operator would be dealing with residual calcium carbonate tests that were too low.”

Mondi SCP’s mill in northern Slovakia is in harmony with nature – nestled among mountains, rivers, and the small community of Ružomberok.

To compensate, the mill purchased a significant quantity of lime. Unfortunately, there was a significant difference in the behavior of the purchased lime and the lime produced in the mill which caused fluctuations in the white liquor plant that then rippled through the fiberline.

Extra energy consumption in the form of natural gas was also costing money. Then, too, there was a motivational problem: operators were tired of having to blast away ring formations or enter the kiln to attend to other problems.

“We had done everything we could mechanically,” Krajci says. “We felt there was nothing more that we could do, other than replace it.”

“Told us by surprise”
Inquiries went out. ANDRITZ was asked to propose a kiln replacement or whatever technical solution they might have to eliminate the starting and stopping of the kiln.

Instead of a replacement kiln, ANDRITZ proposed a KilnACE® automation solution.

“We didn’t know much about ANDRITZ Automation’s capabilities at the time, but we decided we would politely listen,” says Branislav Benco, Head of DCS for the recovery area. It turned out to be a good discussion.

“ANDRITZ took us by surprise,” Benco says. “The more we learned about KilnACE®, the more we liked the concept. The technology runs on a standard PC and uses an open communications standard which could...
be easily linked to our Distributed Control Systems. Where other automation suppliers said that we would need additional instruments, or a special control system, or months of programming, ANDRITZ felt that our instrumentation was fine and they could have the control up and running in only a few weeks."

"On top of this," Krajci says, "ANDRITZ offered a trial period so that we could see for ourselves how much improvement we could get."

**BrainWave® layer is unique**

Sava Kovac, Principal Developer for Advanced Control Solutions for ANDRITZ Automation, was put in charge of the project to ensure great results for Mondi. Kovac explains that KilnACE® consists of two layers: a BrainWave® controller to stabilize the process, and the ACE® layer which does optimization.

According to Kovac, BrainWave® is different than other controllers on the market. "It outperforms other control technologies because of two main components: an adaptive model and a predictive controller," he says. "Adaptive control means that it learns based upon past performance. It doesn’t have to wait for an error to occur and then react — it can predict the process response."

Of the many features, the one that interestedit the most was MIMO. "MIMO stands for multiple input, multiple output," he says. "It coordinates the control of multiple variables so they don’t interfere with each other. I don’t know of any other controller that can do this. Just like our operators get better with experience, so does BrainWave."

**Impressive results**

"BrainWave® stabilized the temperatures and excess oxygen in very short order," Benco says. "But our operators were skeptical and tended to run the kiln in manual like the old days. We also had some technical issues to clear up. But I can tell you now that operators use the control 100% of the time."

"The ANDRITZ control is able to hold the kiln temperature in a narrow window so my operators can run high production and avoid the severe ringing we experienced before," Scholtz says. "Solving this problem was the primary goal of the project. Even though we use about 20% noncondensable gases, including stripper off-gases in our fuel mix, the control can handle the variations in heating value."

"There are economic benefits, quality benefits, and human benefits," Krajci remarks. "We purchased the ANDRITZ control package based upon an estimated six months payback. I can tell you that the payback was much quicker. The economics come from a significant reduction in purchased lime, a reduction in specific energy consumption, and a big reduction in production stoppages to blast ring formations. These events are much more rare now."

"Equally important to me is the fact that my operators are no longer stressed and have a much safer environment working around the kiln now. They rely on the control system and trust it. Things are running steady-state now and there is a smooth transition from shift to shift."

**ACE in the future?**

ACE® is an "expert operator" layer that sits above BrainWave® and manages everything about the kiln operation: production rate, temperature targets, and excess oxygen targets to maintain a certain quality and throughout. The only input from the operator is the lab test for residual calcium carbonate. Unlike a "black box," ACE® advises the operator at all times about what it is doing or planning to do.

The Ružomberok mill is using the BrainWave® layer of KilnACE® 100% of the time to stabilize the kiln operation. The main goal of this project was to maximize production and eliminate production stops.

"We are very happy with the present situation," Krajci says, "so we are currently not running all the ACE® modules that we could. At our mill, the kiln temperatures must be highly constrained to prevent plugging at the feed end (low temperature limit) and ringing (high temperature limit). There is little room to adjust parameters for residual carbonate control, so it’s not clear how much more we could benefit from the other ACE® functions."

"But," he says as he winks, "we intend to give it a try soon and see if we can improve upon an already good situation."
China’s Sun sets sights on expansion

China’s forests are unevenly distributed across the country, making fiber supply still a critical issue for its pulp and paper producers. While the supply of chemical pulp is comparatively low, Sun Paper’s new ANDRITZ chemical pulp line in Yanzhou is helping the company become more self-sufficient as they renew their expansion plans.

A recent joint UN/EC publication documents a significant challenge for China’s papermakers. The nation has the fifth largest forest area in the world, mostly in the northeastern and southeastern regions of the country. Still, this represents just over 20% of the country’s land area – placing China at the 19th position in the world.

To meet the growing needs of its 1.3 billion people, China has the challenge of expanding production from its own forests, while managing the impact of being heavily dependent on imported fiber.

This development can easily be verified by listening to one of ANDRITZ’s major customers in China. Ying Guangdong, Deputy General Manager and Chief Engineer of the Sun Paper Group, Yanzhou, Shandong Province, has several investment plans for the coming years – investments to increase pulping self-sufficiency while growing Sun Paper’s business to Indochina, especially to Laos and Vietnam.

Sun Paper is largest

Shandong Sun Paper Industry is the largest privately owned and managed paper business in China, as well as the largest producer of premium coated packaging board. Its paper and board products are sold throughout China, and exported to more than 20 countries in southeast Asia, Africa, and the US.

The company’s many paper machines (with a new one now being started up) have total annual capacity of 2.5 million tonnes. A significant part of the pulp comes from two ANDRITZ P-RC APMP mechanical pulp lines, with a third under construction. And now, a new ANDRITZ chemical pulp fiberline has been started up.

World-class start-up

After successful delivery of the second P-RC APMP pulping line and effluent evaporation system, Sun Paper ordered a 500 bdmt/d chemical pulp fiberline from ANDRITZ in June 2008. An additional order for recausticizing and woodyard equipment from ANDRITZ, which completed the kraft mill project, came shortly after. By mid-November 2009, the systems were started up in what Sun Paper calls “world record time” – only 17 months after signing the contract. The start-up was smooth and design capacity was reached in less than three weeks.

According to Ying, the start-up of the fiberline was very successful. “There were not many difficulties, thanks to the good preparation work conducted,” he says. “ANDRITZ made some adjustments to the DD washer so we could increase capacity considerably.”

“The operation has been smooth, and the output has increased some 20% over the design capacity,” Ying says. “We have also achieved an alkali recovery rate of more than 97% and reached the target of zero emissions of black liquor. The mill is energy self-sufficient and we also supply steam for some small paper machines.”

Moreover, the quality of pulp has been excellent, according to Ying. The brightness guarantee is for 88 ISO, while the actual results have been 90 ISO.

Tough bidding

ANDRITZ received the order from Sun Paper amidst a hard international bidding competition. “Our main competitor had a strong position already at this mill, but we were able to receive the order with a package that included key equipment manufactured in Finland and the rest in China,” says Jorma Olkkonen, ANDRITZ’s Project Manager for the fiberline.

According to Ying, Sun Paper chose ANDRITZ mainly because of the price-performance ratio and the ability of ANDRITZ to provide a portion of the equipment locally. He notes that the line was built in the midst of the economic downturn, so that construction costs were somewhat lower. After the line started production, market...
In China, and perhaps other parts of the world, there has been a tendency to think of continuous cooking systems only for large greenfield chemical pulp lines. In fact, there are digesters operating around the world producing near 4,000 t/d. But, the cooking technology combined with DD washing is still very competitive for smaller capacity lines, as demonstrated by the 500 t/d line at Sun Paper.

“Sun Paper’s schedule for installation was very challenging,” Dikkenon says. “We were able to put our best resources on supervising the erection, and our customer put all their efforts into the erection work. We installed the complete fiberline in six months, which is a world-class installation time.”

Good cooperation makes a successful project

According to Dikkenon, Sun Paper had a very experienced project team, and the engineering staff was skilled. “I know Liu Yanbo, the Project Director, from an earlier project in Rizhao, so the cooperation was easy from the very beginning,” he says.

“ANDRITZ has a deep experience in pulp making and running projects,” Liu says. “They have many excellent technologies, especially for controlling emissions and effluents. Our successful cooperation is based on very good communications. We know ANDRITZ’s capabilities and they know exactly what we need. If we see a problem, ANDRITZ offers a solution.” Then we discuss it together. This is what we mean by teamwork,”

Liang Hongjin, Production Manager

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Liu Yanbo, Project Director

Self-supplied pulp reduces pressure

“Our main objective was to improve our self-supply capacity of pulp,” Ying explains. “With purchased pulp, we are captive to fluctuating prices and the cost of transportation, which impacts our margins. Through this chemical fiberline project, we reached our target of self-producing 250,000 t/y each year, reducing the external cost pressures. We can also better control the pulp brightness and strength.”

He says that before this project, the company produced chemical pulp in two old lines with an annual capacity of some 50,000 t. Together with the P-RC APMP systems, Sun Paper can now produce 600,000 t of pulp each year.

Indochina will be Sun Paper’s next target

According to Liu, one more reason for Sun Paper to build the pulp mill was that they did not have modern pulp mills before, and they wanted to gain experience for building new mills in other locations in the future.

Preparations for a Laotian project are completed, and Sun Paper will open the project for bidding in the near future. The project will be in Savannakhet, close to the border of Vietnam. “We have talked about the preliminary schedule with ANDRITZ experts,” Liu says. He says that the most important things to consider are the solution and the technology, and after them comes the price.

The raw material for the new project will be eucalyptus from South China and some eucalyptus and acacia from Vietnam, Thailand, and Indonesia. According to newspaper reports, the company plans to establish eucalyptus plantations in the Savannakhet province, but these plans are still in the planning phase.

“First, the equipment has run for three months since start-up in a very stable and efficient way,” he says. “The pulp quality is consistently good. We still need to put more effort into optimization and maintenance. We discuss with and learn from ANDRITZ. I feel very satisfied with our cooperation.”

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Jorma Dikkenon, ANDRITZ’s Project Manager
Maintenance solutions offer new alternatives

In June 2007, ANDRITZ acquired a stake in a unique company, Sindus Human Technology, which specializes in maintenance services. Sindus fits well with ANDRITZ’s own Overall Production Efficiency (OPE) concept for maintenance. These combined offerings for maintenance grow in value and importance.

An alternative is a full outsourcing package from ANDRITZ, such as that utilized at Fray Bentos. The main difference between the services in place at Fray Bentos and those provided by “generic” technology or service companies is ANDRITZ’s value-added in having intimate knowledge of the processes and equipment, as well as advanced diagnostic tools. “Combining knowledge with local experience gives customers a package with substantial cost savings and better maintenance performance,” Katajamaki says.

With the idea of creating a unique combination of capabilities, ANDRITZ began acquiring Sindus Human Technology of Brazil in 2007. Today, Sindus ANDRITZ is wholly owned and is expanding its capabilities outside of South America. Sindus ANDRITZ has been providing outsourced maintenance to mills for the past 18 years. The very first contract written is still in force today, after several renewals. “If customers don’t see the value in what we are doing, they don’t renew,” says Luis Binotto, Senior Vice President of Maintenance Solutions for ANDRITZ. “Our contracts agreed upon Key Performance Indicators (KPIs). Financial incentives and penalties are structured so that we are obligated to document and demonstrate the value we add.”

Example of value-added

After two years of internal development, Sindus ANDRITZ offered a process control optimization service to its customers. It is a combination of special software (called OPP™), plus the company’s knowledge of equipment and control systems; plus the knowledge of mill processes.

“It is a very powerful tool,” Binotto says. “It allows us to monitor several things online: the current state of the control (valves, motors, alarms, bypasses, analyzers, and control loops), the condition of the asset, potential failures, and the impact on process performance.

“Armed with this knowledge, we do condition-based maintenance of the assets. It also has integrated diagnostics which are very useful for highly complex plants – reducing the time it takes to diagnose a problem from days down to minutes.”

The OPP™ software collects information from the DCS and PLCs to give a complete millwide vision. “We identify opportunities to improve the control and work on any area that the customer defines as a priority,” Binotto says. Sindus ANDRITZ estimates that its customers are saving about US$ 40 million per year using this service. “There is no other approach that could provide fast results at this investment level,” Binotto says.

Best millwide example

Köfler feels that ANDRITZ has the possibility to be the best maintenance supplier for single-line continuous processes. “These operations rely upon excellent maintenance,” he says. “Equipment availability is critical for continuous production.”

The best example of ANDRITZ’s millwide maintenance capabilities is the UPM mill in Fray Bentos, Uruguay. The single-line pulp mill was designed to produce over 900,000 t/a of bleached pulp and the actual production is over 1,000,000 t/a.

For new capital projects such as Fray Bentos, ANDRITZ maintenance engineers join the project team well before the mill is built – creating a long-term maintenance plan, entering maintenance routines and spare parts into a millwide database.

“We identify opportunities and work on any area that the customer defines as a priority,” Luis Binotto, Senior Vice President of Maintenance Solutions for ANDRITZ, says.

“A variety of packages possible

“We have the ability to provide a series of outsourcing options that other companies cannot supply,” Köfler says. “We can maintain instruments only, automation only, mechanical only, do preventive maintenance planning, handle spare parts outsourcing – up to complete mill maintenance outsourcing.”

“Maintenance with separate specialist organizations is typically more expensive and requires more time on the part of mill personnel to coordinate,” Katajamaki says. “It is more difficult to set performance targets since there is no single organization with total accountability.”

In Europe, and especially in the Nordic countries, several pulp and paper producers have chosen to outsource maintenance. In South America, mills widely use external contractors to maintain instruments, electronics, and in some cases, for mechanical maintenance. However, contracting for specialized maintenance can create overlapping costs and unclear responsibilities, according to Aulis Katajamaki, who has overall responsibility for millwide maintenance at UPM’s Fray Bentos, Uruguay mill.

“It all comes down to if maintenance is a core activity. If not, outsourcing should be explored.”

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

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Highlights of KEY EQUIPMENT, UPDATES, AND MODERNIZATIONS

Shandong Sun Paper Industry

Yorkzhou, Shandong, China

Third P-RC APMP system with a capacity upgrade to 150,000 t/a; a complete stock preparation, thick stock screening and approach system for a new paper machine; an MVR (Mechanical Vapor Recompression) evaporation plant; and a blowing screw reclaimer for a chip silo in the woodyard.

Södra Cell

Scania

First RotaBarker™ started in Russia

Krasnokamsk, Perm Region, Russia

RotaBarker™ de-barking line with horizontally.

Kamabumprom

Complete line including stock preparation

Nanning Phoenix Pulp & Paper

Gotsu, Japan

Complete washing, screening, and bleaching system for a new fiberline including 7 GPFMax washer filters.

SCA Ojärnaberg

Sundsvall, Sweden

LimeKiln™ system for a new line; LimeDry™ lime mud filter and LimeFilt™ white liquor filter upgrade to an existing line.

CMPC

Lapa, Chile

EPC delivery of new High Energy Recovery Boiler (HERB) and evaporation plant.

Nippon Paper, Gunma Mill

Gotts, Japan

PM2/pulp drying line.

Nanning Pianran Pulp & Paper

Nanning, Guangxi, China

PrimeLine TM line

Complete the including stock preparation.

New CENTERS

Shandong Sun Paper Industry

Yorkzhou, Shandong, China

Two biomass power boilers.

Kamabumprom

Krasnokamsk, Perm Region, Russia

Rotobaker™ de-barking line.

Södra Cell

Väst, Sweden

AWP Wash Press, evaporation plant, recovery boiler retrofit.

Second order for new AWP Wash Press.

Nonwovens Technology

ANDRITZ recently acquired Rieter Perfojet, a French company that manufactures machinery and systems for the production of nonwovens. The company is now called ANDRITZ Perfojet.

Perfojet products are used successfully all over the world for the hydroentanglement of nonwovens. This technology employs jets of water to entangle the fibers, which creates integrity. Softness, drape, conformability, and relatively high strength are major characteristics of this production method. The addition of Perfojet fits well with the capabilities of ANDRITZ Küsters, which also has operations in the nonwovens sector.

Biax Business Shows Promise

Earlier this year, ANDRITZ acquired certain assets of the insolvent DMT Group, headquartered in Salzburg, Austria, and its subsidiary in France. The company, now ANDRITZ Biax, is one of the world’s leading manufacturers of systems for the production of biaxially stretched (biax) plastic films. These films are used for many applications; particularly as packaging material for the food industry.

ANDRITZ Biax supplies equipment and turnkey plants for the production of biaxially oriented plastic films from Polypropylene, Polyethylene Terephthalate, Polyethylene, and other materials.

The “jumbo roll” of biaxially stretched film was produced on equipment now sold by ANDRITZ Biax. The films have multiple layers and can be produced from different materials to make packaging with various thicknesses and other properties.
Thinking of the next generation: P-RC APMP

For you. The P-RC APMP* process is advanced technology for producing high quality chemi-mechanical fibers at the lowest operating costs. It saves money, saves energy, and in some applications enhances fiber properties.

* Pre-conditioning Refiner Chemical Alkaline Peroxide Mechanical Pulp

For your children and grandchildren. We take our commitment to delivering safe and environmentally sound technologies very seriously. Our P-RC APMP systems conserve energy and wood resources – reducing CO₂ emissions and contributing to sustainable production in your community.

www.andritz.com

We accept the challenge!