Independent and unique producer creates a “pearl” of an installation in Switzerland – Page 4
Global vote of confidence – thank you!

There has been a good level of activity in global pulp and paper industry (both for greenfield lines and the modernization of existing lines). The large investments continue to be focused in the southern hemisphere and Asia.

Pulp and paper pricing, in general, is improving. This, together with improved technology that helps lower operating costs, creates a positive influence on our customers’ ROI calculations and leads to more trust from the financial community.

In the process of working on our increased order backlog, we managed to improve the Sales of our pulp and paper business in 2005 by 16% compared to 2004 – exceeding € 1 billion. A notable start-up was the Vesecal mill in Brazil (FiberSpectrum 2-2005). Other major start-ups included Finland’s M-ral (fiber processing equipment and flash drying systems for a new BCTMP mill), China’s Shandong Hengan Paper (new 200-inch high speed CrossFormer tissue machine), Portugal’s Protex (new recovery boiler) and the “start-up” of our own Fiber Preparation Pilot Plant in Graz. In China, Jiang Lin (the world’s largest pulp drying line when it was built) set a world record for pulp drying production – over 3500 t/d of finished bales into the warehouse. Andritz also supplied the woodyard, which is also the world’s largest.

Some of the major orders we received were the major process equipment for Domina S.A.’s new pulp mill being built in Uruguay and an EFC fibeline and the chemical recovery systems for Marusumi Paper’s Ohe mill in Japan. In the tissue segment, Procter & Gamble awarded us the order for a complete TAD tissue machine in the USA.

The global number of our customer partners in the pulp and paper business is truly astounding. Each of our divisions booked new and repeat orders in 2005 from customers that read like the Who’s Who of the industry:

South America: Suzano Bahia Sul, International Paper do Brasil, VCP, and CENIBRA.
Australia-Oceania: Carter Holt Harvey and Australian Paper.
Russia: JSC Arkhangelsk Gip, JSC Group, JSC JTI Yelets, and Solikamsk.
Middle East: Middle East Paper and Yildiz Suntal MDF.

This follows our vision and strategy to be a life cycle, full life partner for high-tech production systems, modernizations, and services for the pulp and paper market segments we cover. We truly appreciate this global “vote of confidence” and will, as always, work to maintain your trust.

Thank you!

Markku Hänninen
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Upgrading the Swiss “pearl”

To meet increased customer demand for its lightweight coated grades, Perlen Papier of Switzerland needed a 36% production increase from its deinked pulp line. Andritz provided the solution.

Perlen Papier’s mill lies in a picturesque valley on the River Reuss just north of Lucerne. The company, founded in 1872, produces about 300,000 t/a of newsprint and LWC paper on two paper machines.

PM4 (called the “Pioneer”) manufactures high-grade LWC offset papers. In May 2000, Perlen started up PM4 and broke new ground by having the paper produced, coated, calendered, and rolled into large reel-spools inline.

Market forces increased the demand for its products, so the company chose to increase the production of LWC by 50,000 tonnes to 200,000 t/a during 2006. To meet its new production target, Perlen had to increase the output of its deinking plant.

Andritz was selected to install the key equipment to raise production from 280 to 380 t/d. The investment was valued at SFr 21 million (€13.3 million). Perlen utilizes mechanical, virgin, and recycled fiber in its products. Chips for the TMP line come from local suppliers. The virgin fiberline processes purchased pulp.

No need to sort

The majority (95%) of Perlen’s raw materials comes from Switzerland. The remaining proportion originates from Germany, France, and Italy. Until 1999, Perlen used to sort its recovered paper, but since then it has been in a position to accept unsorted paper.

“The public is very well educated here about sorting, so the paper quality we receive has improved.” (Michel)

“We work closely with the local authorities who collect from households and other sources,” says Jörg Michel, Production and Technical Manager and a Member of the Board of Perlen Papier AG. “The public is very well educated here about sorting, so the paper quality we receive has improved. Individual households tie the recycled paper into bundles which go straight into the pulp- ers.”

The mill no longer accepts old magazines unless there is a shortage of the other recycled grades, which sometimes occurs in the summer months. The increase in capacity, according to Michel, will not require Perlen to look outside their existing procurement channels.

Upgraded deinking

“In addition to the added capacity, we also wanted to improve the quality of the furnish for both our LWC and improved newsprint,” says Jörg Michel. We wanted to keep our investment at a reasonable level and we only needed an extra 100 tonnes per day,” Michel says. “So we chose to upgrade our existing facility rather than invest in a new plant. The minimum practical size for a new facility would be 600 tonnes per day, almost double our near-term requirements. If we would ever choose to add another paper machine, then we would consider building a new deink plant.”

Perlen Papier has had good cooperation with Andritz for a number of years. In fact, the Andritz RTS™ refiner...
for the production of high-quality TMP
installed in 1994 was a pre-condition for
the installation of the new PM4 in 2000.
The refining process plays a crucial role
in ensuring that PM4 produces paper of
the high quality which Perlen’s custom-
ers demand.

“We consider Andritz to be the
most flexible and innovative supplier,”
Michel says. “Andritz has always been
prepared to take on a challenge. It is
an independent company, not linked to
any other organization, and prepared
to work in close cooperation with us in
order to come up with the best way of
solving problems.”

The Andritz solution
Manager of the DIP and TMP lines,
Hans Jörg Aregger, proudly gives a
tour of the new installation. The project
involved the rebuilding and extension of
the existing deinking unit, installation of
post-refining for the stock on PM5, and
extension of the kraft line.

In addition to the equipment, Andritz
supplied basic and process engineer-
ing, services for control and measuring
equipment, electrical equipment, auto-
mation, and supervision of the instal-
lation. The project was completed and
handed over to Perlen in March 2006.
The new section was added on another
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floor above the existing plant.

At the existing plant level, a new
FibreSolve™ pulper doubles the pulp-
ing capacity of the facility.

This new pulper is the same size
as the existing one. Both are fed by a
new conveyor, which has a distribution
system between the two pulpers.

Following the two pulpers, the exist-
ing detrasher is used. Rejects go to
a reject drum, while accepts are fed
through a high density cleaner via a
dump chest and medium-consistency
screens to the pre-floatation cells.

The existing screens were rebuilt to
accommodate coarse and fine screen-
ing and two new ModuScreen™ A units
were added for fine screening to handle
the additional capacity.

In what is now the top floor of the
building, the machine hall is dominated
by the SelectaFlot™ pre-floatation unit. This consists of six primary flotation
cells and two secondary cells.

Inside the cells, the injectors are
situated along the center axis with foam
weirs on either side. The rejects from
the primary cells are fed back to the
two secondary cells at the front end
of the main unit. Aregger noted that,
at the end of the six flotation cells, the
stock has improved up to eleven points
of ISO brightness, which is a much
higher gain compared to the existing
deinking system. Following the pre-
floatation cells, the stock passes through
low-density cleaners to a fractionator.
A ModuScreen™ A has been installed
for this purpose, separating the long
and short fibers.

“The Andritz idea of fractionating
recycled fibers made it possible for us
to significantly raise the capacity to the
500 to 550 tonnes of recovered paper
that we feed through the process each
day,” Michel says. “Without fractiona-
tion, we would probably have not been
able to use our existing plant and would
have had to build a completely new
system.”

After fractionation, the short fibers
pass through a disc filter and then to
a mixing tank prior to the post-flota-
tion stage. Long fibers pass through
low-consistency slotted screens, on to
da filter, and then to an Andritz twin
wire press for dewatering.

The long fibers are then heated
and dispersed in existing equipment. The
stock is diluted to medium consistency
at the outlet of the disperser and then
pumped into the mixing tank. In this
tank, the long fibers are mixed with the
short fiber accepts.

Aregger notes that stock out of the
SelectaFlot™ unit has improved up to 11
points ISO brightness over the existing
deinking system.

Efficient mixing at the post-bleaching stage
is done by an Andritz high-consistency mixer.

ModuScreen™ A for both applications,
fractionation and fine screening.
Post-flotation is next in the process. This existing flotation stage has two lines, each with five primary cells and a secondary cell for rejects.

Following a disc filter in the second loop, the stock to be bleached passes through a new Andritz screw press and a high-consistency mixer where hydrogen peroxide is added. Retention time in the high-consistency bleach tower is about one hour. Andritz also supplied the discharge system for the bleach tower.

Near the HC bleach tower are towers for holding the bleached and unbleached stock. These two towers deliver the furnish to the paper machine approach system for PM4 and PM5.

In the post-treatment system, Andritz provided two Papillon™ refiners, one in the DIP line and the other in the TMP line. In the virgin fiberline Andritz upgraded the pulper with a FibreSolve™ system and two additional Papillon™ refiners.

“In total, we now have four Papillon™ refiners,” Michel says. “We have two for the kraft pulp furnish on PM4, one for post-refining TMP, and one for post-refining DIP on PM5. The beating performance and improvement in quality and energy consumption of the refiners, which were our main targets, is what we were expecting. We are convinced there are further opportunities for optimizing the post-refining of our TMP and DIP furnishes.”

“Things are going quite well,” Michel says. “We are still optimizing the fiber yield, but all the main targets were met within two months of start-up.”

Prior to the upgrade, Perlen was reaching about 58% ISO brightness before bleaching. Now it routinely achieves 61% ISO ±1 prior to bleaching with peroxide. “Our pulp now goes through the disperser without being bleached,” Aregger says. “On LWC grades, we have achieved 70 to 71% ISO brightness following peroxide bleaching at the end of the second loop.”

“Early results”

“Future plans”

“Perlen Papier AG is a member of the Chemie & Papier Holding Group. It is Switzerland’s last independent producer of standard and improved newsprint and the country’s only LWC manufacturer.”

Managing Director Frank Ruepp says, “We have always had a family-oriented culture. We are a small producer in the market, a niche player. We have the reputation of being flexible and reliable. We aim to give value through our speed, innovation, and close cooperation with our customers.”

Ruepp believes that the company is in a good position to expand. “We plan to focus on our core business of manufacturing paper for the mass markets of the printing sector and continue to grow organically. This will involve internal development and investment in production processes to maintain the very latest technologies.”
Better feed – better cook

Two successful upgrades to the chip feeding line at Norrsundet have removed a costly bottleneck and now keep high-strength pulp flowing to Stora Enso Publication Paper’s nearby mills.

The chip bin was installed with the original continuous cooking system. The early design bin, which was state-of-the-art when installed in 1973, employs a ‘bin activator’ that vibrates the mass of chips to keep them flowing. The vibrating motors are mounted around the circumference of the moving bin bottom. This design helps to move chips out of the bin bottom, but is a high maintenance solution, according to Ulf Lundström, Customer Service Manager for Andritz’s Pulp Mill Services Division in Sweden.

Norrsundet’s chip bin problems resolved when a new steaming vessel was installed in 1973. The early design bin, which was state-of-the-art when installed in 1973, employs a ‘bin activator’ that vibrates the mass of chips to keep them flowing. The vibrating motors are mounted around the circumference of the moving bin bottom. This design helps to move chips out of the bin bottom, but is a high maintenance solution, according to Ulf Lundström, Customer Service Manager for Andritz’s Pulp Mill Services Division in Sweden.

A new Andritz chip metering screw, in combination with the Diamondback® chip bin and an extended chip chute, have eliminated Norrsundet’s chip feeding problems.

“The motors, hangars, and bottom seal are subject to wear and require periodic replacement,” Lundström says. “Also, the flexible rubber boot that seals the bottom can tear and leak process gases. From a process perspective, the steamed chips in the bin have a tendency to stick at constricted points in the bin, causing uneven flow. The bin design is like a funnel, which can result in chips that are not adequately presteamed due to wide variations in residence time in the bin.”

Andritz recommended, and Norrsundet selected, an upgrade to the feed system with a new Andritz Diamondback® chip bin. The Diamondback® has a unique geometry that moves chips without sticking or “bridging” – and has no moving parts.

The result is a smooth flow of chips from the conveyor to the reduced diameter of the chip metering device. Norrsundet’s chip bin problems disappeared with the upgrade to the Diamondback®. But no sooner were the chip feeding problems resolved when a new bottleneck appeared – the old steaming vessel.

Less equipment and no compromise

The old steaming vessel was in too bad a condition to repair, as both the screw and housing were damaged over the years, but the primary bottleneck was the short chip chute. This left little “margin for error” if there was any disruption in chip flow. The process control system stopped the chip chute frequency due to high chip parts.

“It became evident that we had to do something with the steaming vessel as we were losing production,” says Bernt Åkerdahl, cooking process expert at Norrsundet. With a career spanning 35 years at Norrsundet, Åkerdahl has seen just about everything possible in a cooking process. “The question was whether we should order a new steaming vessel or find another solution.”

In early 2005, Åkerdahl asked the process experts at Andritz to visit the mill and survey the situation. Andritz presented an alternative to upgrade the process section with new technology. Norrsundet’s success with the Diamondback® chip bin paved the way.

“If we had replaced the steaming vessel only, we would not have seen any improvements in overall production,” Åkerdahl says. “Thanks to a well thought-out concept presented by Andritz, we would actually be able to...
increase our capacity and reduce the amount of process equipment. Andritz ensured us that we would have a more stable process without making any compromises in our quality targets.”

**Andritz chip metering screw**

The second Andritz upgrade of Cooking Line 4 consisted of replacing the old steaming vessel and chip meter with an Andritz chip metering screw and extended chip chute. The work began in early October 2005 and took six days to complete. According to Lundström of Andritz, chip metering screws are routinely utilized in new cooking systems, but are also valuable retrofits if there is a large offset in the chip bin or if a new chip bin is built next to an existing one.

The Andritz chip metering screw is a horizontal screw feeder that measures and controls the volume of chips entering the cooking system. Each revolution of the conveyor feeds the same volume of chips. There are two basic models—single-screw and double-screw.

Norrsundet installed the single-screw model, which uses a single conveyor screw to meter the chip flow.

This model is normally used for smaller chip feed rates and where the inlet nozzle is small.

**Now and in the future**

The steaming vessel was also removed as part of the second stage of the upgrade project. In the future, the Andritz design allows the mill to easily incorporate the TurboFeed® chip pumping system (which eliminates the High Pressure Feeder) into the cooking line.

“Following the start-up on October 8, we have not encountered any production bottlenecks and the quality is just right,” Lundberg says.

“The project went perfectly in every way. It was carried out with a spirit of great cooperation. I think the biggest challenge for us was dismantling the old equipment to make way for the new Andritz technology within the planned shutdown time.”

Any plans for an upgrade to the second cooking line—or installing the TurboFeed® system?

“It is always a matter of priorities,” Åkerdahl says. “The same type upgrade that we did to Line 4 can, in principle, be done for our second cooking line. It certainly has potential. I feel that we will do the upgrade; it’s just a matter of when.”

“The cost savings we have achieved and the more stable process are very important to us,” Lundberg says. “The technical accomplishment here is the ability of the upgraded technology from Andritz to process more chips in this relatively narrow screw than we could before with a steaming vessel that was three times bigger – while maintaining the same good quality. I am very happy to say that my initial skepticism about achieving production over 500 tonnes a day has completely disappeared.”

**Norrsundet**

The Norrsundet pulp mill in Sweden was founded in 1923. During its early years, the annual capacity of 15,000 tonnes made it one of the largest and most modern pulp mills in Sweden. Today, Norrsundet is a well-known producer of long fiber (reinforcement) pulp – adding strength to various kinds of paper products. Today, the mill has an annual production capacity of approximately 295,000 tonnes.
Investing for the future

Ružomberok (known also as Rosenberg) is a town with approx. 35,000 inhabitants nestled in the mountainous Žilina Region along the Váh River. With a history of papermaking dating back to the mid-17th century, today MONDI BUSINESS PAPER (MBP) SCP is the largest fully integrated pulp and paper mill in Slovakia. The mill is also the principle employer in Ružomberok, thus MBP SCP is totally committed to corporate citizenship and the welfare of internal and external stakeholders.

"Ružomberok mill has been an integral part of my life and I am proud to be a part of the investment and modernization programs for this world-class mill. We have competent and dedicated employees and state-of-the-art equipment; that said, I firmly believe there is always room for improvement no matter what we do," says Vladimir Krajčič, MBP SCP’s Head of Recovery Line and third generation employee at the mill. MBP’s CEO Günther Hassler explains: “In Ružomberok, the local management team did an excellent job to develop the site to a first class central European integrated mill. In many operational respects Ružomberok leads the MBP internal benchmark, which is the result of highly motivated and skilled people and meaningful investment programs.”

MBP is striving to become the benchmark leader in business papers by the end of 2006, with Operational Excellence and Sustainable Development as the cornerstones of this program. "Sustainable management means investing in the future. This not only involves well managed forests and minimized emissions, but also social responsibility. In addition, a unique Group-wide idea management system reinforces our commitment to innovation and better market knowledge. These, along with close customer relations, are the basis for supply chain leadership," says Hassler.

In 2005, the mill produced more than 400,000 tons of pulp and over 480,000 tons of uncoated wood-free office papers. Most of the paper produced at Ružomberok comes from hardwood and softwood pulp manufactured at the pulp mill on the premises.

"A significant landmark occurred in 2002 with the implementation of a € 240 million modernization program called the IMPULS project. Our PM18 was rebuilt and the pulp plant was completely renovated. This increased mill capacity considerably and, more importantly, dramatically improved our environmental performance," says Krajčič.

Increasing capacity, decreasing environmental impacts

Today Slovakia is a young, vibrant and independent nation, albeit, the Slovaks have existed as a unique entity for over 1500 years. Slovakia joined both NATO and the EU in the spring of 2004.

Slovakia has mastered much of the difficult transition from a centralized planning economy and has become a modern market economy. The government has privatized most businesses. The banking sector is mostly owned by banks of EU member countries. Furthermore, the government has helped facilitate a foreign investment boom with business-friendly policies. Economic growth continues to prosper, especially in the automotive industry. Slovakia’s economic growth exceeded expectations in 2001-2005, despite the general European slowdown.

Slovakia is landlocked and its terrain is mountainous and rugged which encompasses the Tatra Mountains in the north. Austria, the Czech Republic, Hungary, Poland, and the Ukraine surround Slovakia, which is geographically considered to be central Europe.
A decade of partnership - Andritz and Ružomberok mill

1994/95 Rebuild and extension of the recausticizing plant: new slaker, causticizer, Ecofilter, and CPR lime mud filter.

1998 Evaporator plant audit. Installation of smelt dissolving tank and scrubber. Retrofit of recovery boiler, including air system modification.

2001 Installation of vacuum system for evaporation plant, including control and manual valves.

2002 New recovery boiler.

2003 Installation of NC regeneration system and main components for Phase 1 evaporation plant extension. Installation of Phase 2 MVR pre-evaporation. Installation of chip screen for woodyard.

2005 Consignment inventory for refiner plates. Headbox screening system for PM 16 and new cleaner plant.

The IMPULS project yielded significant improvements for the environment. Data shows that the modernization of the pulp mill has reduced emissions significantly and the environmental performance of the mill has improved. “I would like to highlight that emissions have been significantly reduced through the use of the latest technology. The complete elimination of sulfur has resulted in a reduction of more than 90% in odors. And, SO₂ emissions have been cut by around 64% and, therefore, meet all BAT – Best Available Technology – standards. Furthermore, particulate emissions from the lime kiln have fallen by more than 95%. These are significant changes which have a positive outcome for the local community,” notes Krajči.

Ensuring long-term competitiveness

For a mill like MBP SPC to succeed on all levels it is crucial that its suppliers deliver superior and innovative equipment. A profound understanding of operations is fundamental, coupled with undivided attention to detail, which is essential. Andritz has been a partner with MBP SPC since 1995 with the most significant deliveries and installations completed during the IMPULS project. “We researched several options for modernizing and making the mill more efficient. Andritz was the most suitable partner regarding equipment, cooperation, installation, price, and delivery. That said, we did put very high requirements on Andritz regarding guarantees, but they were, and still are, able to pull it off starting with, for example, the evaporator retrofit project. Over the years, Andritz has proven to be an excellent choice and partner,” says Krajči.

The evaporator project was split into two phases, explains Andritz’s Henrik Eneberg, Sales Director, Recovery Division. The first phase was the rebuild of the multi-effect evaporator and the second phase was to install a new Mechanical Vapor Recompression (MVR) pre-evaporator. “Evaporation is done with electrical energy by compressing the vapor with a fan. We closed the first phase in summer 2003 and the second phase was left as an option, and consequently ordered shortly thereafter in November 2003.”

Head of Andritz’s US sales team, Lisa Simonen sold the recovery boiler which was delivered and installed at Ružomberok mill in record time.

<table>
<thead>
<tr>
<th>Emissions (kg/ton pulp)</th>
<th>Before IMPULS</th>
<th>After IMPULS BAT</th>
</tr>
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<tbody>
<tr>
<td>TRS</td>
<td>0.66</td>
<td>0.04</td>
</tr>
<tr>
<td>SO₂</td>
<td>3.8</td>
<td>0.8</td>
</tr>
<tr>
<td>COD</td>
<td>13.7</td>
<td>5.3</td>
</tr>
</tbody>
</table>

IMPULS = € 240 million investment program at Ružomberok

BAT = Best Available Technology
The globally active MBP is one of the market leaders in business paper. In addition to its pulp and paper production facilities in several countries, the Group also has forestry operations in Hungary, Israel, Russia, and South Africa.

MBP is a 100% subsidiary of the MONDI Group, which encompasses more than 130 subsidiary companies in 46 countries and over 50,000 employees. In 2005, MBP’s 15,000 employees produced around 2.1 million tons of paper and 1.6 million tons of pulp, generating a total turnover of €1.8 billion. MBP serves its clients on all five continents.

MBP SCP is proactively involved with the local community. In 2002, a four year general agreement was signed with the city of Ružomberok obliging the company to invest approx. €1 million each year in the areas of sports, education, and health. In addition to the funds donated within the framework of the general agreement, MBP SCP supports charities, surrounding towns, NGO’s, and cultural activities with more than €250,000 per year.

The operation was on a global scale with a team working from Andritz’s Atlanta office under the supervision of Jarmo Orantie, Project Manager.

“The project was superbly executed from the signing of the contract to start-up in only 18 months. Albeit, we were somewhat concerned since it involved a team based in the US, production in Finland, and several suppliers from various countries. This type of operation naturally entails detailed coordination and communications. Again, we were extremely pleased with the end result. The recovery boiler has exceeded our expectations and emissions are at almost zero level,” says Krajčí. Andritz also delivers after sales services and maintenance to Ružomberok.

“At the mill, we continuously seek ways to improve capacity and so there are always several smaller jobs which we have in the pipeline. We are fully aware of what the various competitors have to offer in terms of products and services. However, the synergy with Andritz has always been very good and the technology offered is superior. Prior to making any type of investment, we assert a pragmatic and realistic approach for new equipment or upgrades. We seek flexibility and solutions by listening to our suppliers and in this regard Andritz has done so in every phase of a project. But note that the competitors also have advanced technology, solutions, and good prices and it is a very competitive market,” explains Krajčí.

The bottom line

Competitors in this industry are always watching and learning from each other. This involves continuous commitment in R&D, and, naturally, when new and more efficient or innovative products become available, competitors always try to improve upon the existing product. “What is fundamentally important is that equipment ordered exceeds expectations and, moreover, there is continuous cooperation, dialog, and communications between all. Andritz has done well in this. Since the installation of Andritz’s equipment, I have heard no complaints from my staff which means operations are running smoothly,” says Krajčí.
Top quality, top position in China

Active in 14 provinces, Hengan has risen to become the leading domestic corporation for family hygiene products in China. Building upon an eight-year relationship with Andritz, Hengan recently ordered another CrescentFormer tissue machine. In February 2006, a contract signing ceremony took place near the Weifang City mill in Shandong Province. Bernhard Rebernik, head of Paper Mill Technologies and a member of Andritz’s Executive Board, attended the ceremony.

Hui Lin Chit, Deputy Chairman and CEO of Hengan

“We are a young enterprise in the tissue sector, and have not yet reached the status to be considered important.”

Efficient sales network

For Hui Lin Chit, Hengan’s main advantage over its competitors is a highly effective sales and distribution network throughout China. “Before we focused on expanding our production capacity, we built up an extensive sales network,” he says. A further decisive role in his company’s success is played by Andritz. “Ten years ago, high-quality tissue was not readily available in China,” Hui Lin Chit says. “So, when we entered this market, we did not have experience in the production of tissue. In 1996, Andritz held a seminar in China and those presentations started our successful relationship and close communication.” Following the Andritz seminar, Hui Lin Chit visited a number of mills in Europe.

“That is where I saw finished products of extremely high quality,” he remembers. Before he traveled to Europe, he visited plants in Taiwan and other countries in Asia, but found that the quality was not comparable. “I had full confidence that we would soon lead the Chinese market, but no one else seemed to believe that Hengan could be a serious competitor in the tissue industry.”

Bernhard Rebernik of Andritz (left) and Xu Wenmo, General Sales Manager for Hengan, at the signing ceremony for Hengan’s purchase of the latest Andritz tissue machine.

Cao Zhen Lei, President of the China National Household Paper Industry Association.

Soon the skeptics would have to eat their words when the cooperation between Hengan and Andritz turned out to be extremely successful.

The new PM3 at Weifang City will be a duplicate of the PM3 machine shown here. It will have the capacity to produce 60,000 t/a of high-quality tissue, increasing Hengan’s overall capacity to over 240,000 t/a of tissue products.

“Efficient sales network is the main advantage of Hengan,” explains Cao Zhen Lei, President of the China National Household Paper Industry Association (CNHPIA). “In China, almost 1000 companies produce tissue. Only about 20 of these companies produce more than 10,000 tonnes per year, and only four produce over 100,000 tonnes.”

The first machine (PM1) was delivered to Hengan’s mill in Changde City (Hunan Province) in 1998, followed by PM2 in 2002. Each machine has a working width of 3.65 m and produces 34,000 t/a. For Hui Lin Chit, these two machines formed the first stage of Hengan’s development in the tissue business. “During this period, we focused on learning how to handle the technology, training workers, and exploring the market,” he explains.

By 2000, the tissue sector had become the major profit producer for the Hengan Group. The next stage began when the company chose to buy a large machine instead of several smaller machines.

“In 2003, we decided to build two plants, each producing 120,000 tonnes per year,” Hui Lin Chit says. “In 2005, the new PM3 from Andritz started production at Hengan’s new mill in Weifang City. The machine has a working width of 5.55 m at the reel and a design speed of 2000 m/min.”

The mill, 150 km from Qingdao, the port for the 2008 Olympic water sports events, employs 450 people.
PM5, the newest Andritz machine, will be identical to PM3 and is scheduled to be completed by July 2007 at Weifang City.

Each start-up is faster

Rongwang Ren, Deputy Chief Engineer in Weifang, can trace the company’s experience in tissue production to the time it takes to reach the guaranteed production speed level for each machine. “It took 36 months to reach maximum capacity with PM1, 24 months with the second machine, and six months for the third,” Rongwang Ren says. “I think the learning curve for PM5 will be even shorter.” With the tissue business currently growing from 8-10% per year, Hengan can certainly benefit from a fast start-up. At the moment, the company’s supplier of parent rolls for converting cannot keep up with the demand. The sooner Hengan achieves its goal of producing 120,000 t/a from PM3 and PM5, the better it will be for the company.

“Once PM5 is running, Weifang will be the biggest for us in terms of production and sales,” says Hui Lin Chit. “We are benefiting from the long-standing and good cooperation with Andritz. We are very satisfied with the technical support and the service we get. We are pleased that Andritz is continuously enhancing its technology. Each new machine has improved and offers advanced features.”

Hengan is making every effort to achieve design capacity of 180,000 tonnes in 2006. “We will also conclude contracts with suppliers for an increase to 300,000 tonnes by 2010, and we want to increase annual production to 500,000 tonnes,” says Hui Lin Chit.

The Hengan Group

Established in 1985, Hengan Group Company Ltd. was one of earliest foreign investment enterprises entering the sanitary napkins market in the People’s Republic of China.

The Hengan Group has grown steadily to become the largest sanitary napkins manufacturer, the second largest disposable baby diapers manufacturer, and a major supplier of personal hygiene products. Hengan now employs 10,000 people and has a nationwide distribution network.

In December 1998, Hengan stock was listed on the Union Stock Exchange of Hong Kong, which was a great milestone in its short history.

The latest Andritz machine: PM5

Location: Weifang City (Shandong Province)
Capacity: 60,000 t/a
Design speed: 2000 m/min
Working width: 5550 mm
Headbox: Two-layer with dilution control
Former: CrescentFormer
Yankee: 4572 mm diameter
Hood: EquiDryF hood and circulation air system
Other: Felt run with PrimaPickup™ and suction press roll
Advanced reel
Dust removal system
Mist extraction
Start-up: July 2007

Many more opportunities

“We entered this industry in order to meet the demand for domestic products,” Hui Lin Chit says. “We started by producing baby diapers, which was a brand new product in China.”

The concept paid off. Baby diapers turned out to be a very successful production. From 2003 to 2004, diaper consumption reached 2.9 billion units sold. CNHPFA estimates that the volume increased 30% in 2005.

Hengan is China’s leading producer of sanitary napkins, and second in the production of disposable baby diapers. Last year, China consumed 2.9 billion disposable diapers and the market is growing 8-10% per year.
Clash-proof refining

The gap between rapidly spinning plates in a refiner is very small (1 mm or less). Disruption to the chip feed, or a foreign object in the chips, can cause the refiner plates to clash against each other. Sometimes clashes are quite violent – destroying the plates and bearings. A new digital Refiner Protection System (RPS) decreases clashes and increases production stability for Norske Skog Saugbrugs’s TMP mill in Halden, Norway.

A Refiner Protection System is nothing new. Analog versions, designed to protect refiners from plate “clashes” and other serious disturbances, have been around for years.

What is new, however, is the digital RPS developed by Andritz. The digital system responds quicker, is more accurate, and delivers diagnostic information to help determine the cause of the clash.

A plate clash can be a very disruptive and violent event. Imagine the effect of two large masses of engineered metal, one stands still, the other one is spinning at 1500 rpm, being pushed together head-on inside the refiner. This can occur when there is a disruption in the chip feeding system (causing the refiner to be fed with air instead of chips) or when a foreign object (usually metal) enters the plate gap with the chips.

At best, the clash simply causes a production stop. At worst, the plates, bearings, or casing are destroyed. When this happens, a mill is likely to lose at least a full shift of production as the plates and bearings are replaced. In the event of casing damage, downtime could last several weeks. While even a small clash will cause damage, a near-clash will not. A responsive and accurate RPS ensures that near-clashes do not become actual clashes.

**Clashes at Saugbrugs**

The old analog protection system at Norske Skog Saugbrugs mill in Halden, Norway was installed in 1992. Though it was initially state-of-the-art, it had, over the years, become very temperamental. The Saugbrugs mill is one of the largest and most modern production facilities for SC magazine paper (550,000 t/a) in the world.

The old system “shut down the refiner without any reason,” says Kjell Ove Vegstein, Control Engineer at the Saugbrugs mill. The sensors were not reliable and the unfiltered signals from the sensors were often disturbed. “Sometimes it seemed that if you kicked the refiner, the protection system would shut it down,” Vegstein says. “After each shutdown, we would need a minimum of 15 to 20 minutes to get running again.” To compensate for the analog system’s unreliability, operators would lower the protection system’s setpoints, which, in turn, increased the risk for serious plate clashes, according to Vegstein.

**First test at Follum**

A prototype version of Andritz’s RPS was first tested at Norske Skog’s Follum mill in 2003. NSI’s Senior Research Engineer, Karl Mosbye, followed the project from Norske Skog’s side and took part in the evaluation.

Gerald Zeilinger, Automation Engineer for Andritz’s Mechanical Pulping Systems Division in Vienna was the project leader. “We started by running an Andritz SB170 refiner towards a controlled clash,” Mosbye says, “and studying what happens inside the refiner. The digital RPS was used in parallel with the old one. The new system was not in closed loop with the process and, therefore, could not stop the refiner. The data were relevant for the next step.”

When testing the digital RPS, Mosbye and Zeilinger analyzed the Fourier diagrams on the system’s control panel while the refiner was online.

“From the diagrams, we could determine the vibrational frequencies which were most dominant just before a clash,” Mosbye says. “There was no way to do this with the old analog system.”

“Running a TMP line is extremely demanding,” Mosbye says. “It is difficult to get stable and relevant measurement results. The software with the digital RPS gives us new possibilities to optimize the refiner operation. The old system was more of a ‘black box’ which was also difficult to calibrate. Plus, the replacement parts for the old system were quite expensive.”

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Clash-proofing Saugbrugs

Based upon the successful prototyping at Follum, economic analysis for installing the new Andritz RPS at Saugbrugs was conducted in 2004. “We performed the ROI calculations to make sure the project could be economically justified,” says Kjell Arve Kure, Production Manager for Pulp & Energy at Saugbrugs.

The project was approved and the order placed with Andritz in March 2005. The first RPS was installed during a three-day period in autumn 2005 on an Andritz Twin 60 refiner line producing 450 t/d. By November 2005, another new digital RPS was installed on the second refiner line during a two-day shutdown.

In total, Norske Skog Saugbrugs equipped six refiners – four T-60’s and two S3000’s – with the new RPS. An Andritz automation engineer was on-site for the start-up and tuning of the system. Working together, Andritz and mill personnel established the limit values. When the refiner approaches a critical limit, the RPS safely shuts down the refiner and broadcasts the alarm to the DCS in a time interval less than 30 milliseconds.

To enhance the basic operation, Andritz personnel will add some features to the RPS at Saugbrugs. New condition monitoring software, including diagnostics and graphic displays (RPS Condition Monitoring Software) will be added. The software works with operating data stored in the RPS computer to help the mill get information about plate conditions and refiner performance for preventive maintenance planning.

“Newly installed RPS is simple to use and understand. One RPS can monitor up to four units – four refiners, four gearboxes, or a combination of the two. The Andritz digital RPS is now shipped as the standard for all new refiners sold and is offered as an upgrade for existing refiners. “The price compared to performance is very good.” Kure says.

Automation knowledge and pulping knowledge

There are several machine protection systems available on the market, but none are backed by the process expertise of Andritz. “There was never any discussion about who would supply our system,” Kure says. “Andritz RPS is tailor-made for Andritz refiners.” In reality, the Andritz RPS is easily installed on any brand of refiner – not just Andritz. In fact, since the system monitors signals based upon frequency acceleration, it can be installed to monitor other rotating equipment such as gearboxes. One RPS can monitor up to four units – four refiners, four gearboxes, or a combination of the two. The Andritz digital RPS is now shipped as the standard for all new refiners sold and is offered as an upgrade for existing refiners. “The price compared to performance is very good.” Kure says.

Very good cooperation

“The cooperation between Norske Skog and Andritz is very good,” Kure says. “Together, we can continue to develop the refining process at Saugbrugs and also the refiner protection system.”

“We have carried out several different activities and changes to improve performance at the same time,” Kure continues, “so it is difficult to isolate the effect of just the RPS. But we can trace improved refiner operations to the installation of the Andritz RPS. The number of refiner stoppages, for example, has decreased dramatically.”

Kjell Ove Vegstein (left) and Kjell Arve Kure.

There is no need anymore for operators to lower the protection setpoints with the new digital RPS.
Wood Processing

**Complete Lines & Systems**

- **Labe Papir**, Czech Republic
  - Grinder charging and log sorting system
- **Grupo Empresarial Ence**, Spain
  - RotaBarker™ and HQ-Chipper™

**Upgrades & Modernizations**

- **Natron-Hayat**, Maglaj, Bosnia and Herzegovina
  - Baling line
- **Port Worthington**, Worthington, USA
  - 3" line in Weyerhaeuser organization

**Key Equipment**

- **Tolko Industries**, Savon, Alberta, Canada
  - 2 RotaBarker™ lines
- **Indah Kiat Pulp & Paper**, Pekanbaru, Indonesia
  - Pulp charging and log sorting system
- **Bering, Russia**
  - 4 chip threshing lines
- **IP Svetogorok**, Svetogorok, Russia
  - Chipping equipment for TMP plant

**Fiberline**

**Complete Lines & Systems**

- **Baia Sul Celulose**, Mucuri, Brazil
  - Washing, screening, oxygen delignification and bleaching
- **Australian Paper**, Marysville, Australia
  - Cooking, brownstock screening and washing, oxygen delignification and bleaching

**Upgrade & Modernizations**

- **Mitsui-Botnia**, Rauma, Finland
  - Pulp refiner and disc filter
- **Natron-Hayat**, Maglaj, Bosnia and Herzegovina
  - Baling line with RotaBarker™ and HQ-Chipper™

**Key Equipment**

- **Tolko Industries**, Savon, Alberta, Canada
  - 2 RotaBarker™ lines
- **Indah Kiat Pulp & Paper**, Pekanbaru, Indonesia
  - Chipping feeding for acacia

**Fiber Preparation**

**Complete Lines & Systems**

- **Anhui Shenyang Paper Industry**, Ma-anhan, Anhui Province, China
  - Complete deinking line, deinking components and sludge dewatering system for standard newsprint
- **Metallo Paper for Labe Papir**, Opavastritice, Sudecky Kraj, Czech Republic
  - Complete stock preparation system for graphic paper

**Upgrades & Modernizations**

- **Georgia-Pacific**, Weifang City, Shandong Province, China
  - Repeat order
- **Shandong Hengan Paper**, Weifang City, Shandong Province, China
  - Complete recycled fiber system for packaging paper and grade machine approach

**Key Equipment**

- **Labe Papir**, Opavastritice, Sudecky Kraj, Czech Republic
  - Complete recycled fiber system for packaging paper and grade machine approach

**Panelboard**

**Complete Lines & Systems**

- **Yuncheng Xinyuan Jinda Wood Industry**, Yuncheng, Shanxi Province, China
  - Prepressurized refining system for MDF with a capacity of 312 t/d
- **Neuen Bartter, Mashed, Iran**
  - Prepressurized refining system for MDF with a capacity of 336 t/d

**Pulp Drying & Finishing**

**Complete Lines & Systems**

- **TRACOM**, Phuong Nam, Long An Province, Vietnam
  - Flash drying system, slat press, and baling line
- **Shening Heavy Machinery Group**, Shanghai, Lianyungang Province, China
  - Disc filters for dewatering of softwood pulp

**SCA Hygiene Products**

- **Oji Paper**, Matsumoto, Japan
  - Final Andritz baffle system in Japan
- **Ahlström Consolidated**, Snoqualmie, Arizona, USA
  - Paper machine approach and deinking line components for graphic paper

## New Orders

### Wood Processing

- **Complete Lines & Systems**
  - **Labe Papir**, Opavastritice, Czech Republic
    - Grinder charging and log sorting system
  - **Grupo Empresarial Ence**, Spain
    - RotaBarker™ and HQ-Chipper™

- **Upgrades & Modernizations**
  - **Natron-Hayat**, Maglaj, Bosnia and Herzegovina
    - Baling line with RotaBarker™ and HQ-Chipper™
  - **Port Worthington**, Worthington, USA
    - 3" line in Weyerhaeuser organization

- **Key Equipment**
  - **Tolko Industries**, Savon, Alberta, Canada
    - 2 RotaBarker™ lines
  - **Indah Kiat Pulp & Paper**, Pekanbaru, Indonesia
    - Pulp charging and log sorting system

### Fiberline

- **Complete Lines & Systems**
  - **Baia Sul Celulose**, Mucuri, Brazil
    - Washing, screening, oxygen delignification and bleaching
  - **Australian Paper**, Marysville, Australia
    - Cooking, brownstock screening and washing, oxygen delignification and bleaching

- **Upgrade & Modernizations**
  - **Mitsui-Botnia**, Rauma, Finland
    - Pulp refiner and disc filter
  - **Natron-Hayat**, Maglaj, Bosnia and Herzegovina
    - Baling line with RotaBarker™ and HQ-Chipper™

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  - **Metallo Paper for Labe Papir**, Opavastritice, Sudecky Kraj, Czech Republic
    - Complete stock preparation system for graphic paper

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  - **Georgia-Pacific**, Weifang City, Shandong Province, China
    - Repeat order
  - **Shandong Hengan Paper**, Weifang City, Shandong Province, China
    - Complete recycled fiber system for packaging paper and grade machine approach

### Panelboard

- **Complete Lines & Systems**
  - **Yuncheng Xinyuan Jinda Wood Industry**, Yuncheng, Shanxi Province, China
    - Prepressurized refining system for MDF with a capacity of 312 t/d
  - **Neuen Bartter, Mashed, Iran**
    - Prepressurized refining system for MDF with a capacity of 336 t/d

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    - Flash drying system, slat press, and baling line
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    - Disc filters for dewatering of softwood pulp
Key Equipment
ICT Herica
El Burgue de Ebro, Spain
Tissue machine, 5,55 m working width at reel
Repeat order Crescent Former
First commercial installation of Papilon™ refiner in a tissue plant

Upgrades & Modernizations
Kimberly-Clark
Barrow in Furness, United Kingdom
Upgrade pope reel

Paper & Board Machines
May-Neinloth Earbeek
Earbeek, Netherlands
MO-Feed for board machine

Ventilation and Drying
For Tissue and Paper/Board Machines
Key Equipment
Confidential Customer
Kunda, Estonia
Heat recovery unit and humidity sensor

Chemical Systems
Sappi Fine Paper North America
Shoebeghan, Biaise, Italy
LMD-Filter™

Recent Start-ups
Wood Processing
Complete Lines & Systems
Estonian Cell
Kunda, Estonia
Woodpulp
Pre-RelaBarker™ tanking line in Europe

Key Equipment
Andhra Pradesh Paper Mills (APPM)
Rajahmundry Mill, India
Chip screen and refiner

Fibeline
Upgrades & Modernizations
Ill Ilm Pulp Enterprise
Us-Islams, Russia
Cooking plant modernization
Second Andritz digester rebuild in Russia

Key Equipment
VCP
Luiz Antonio, Brazil
Modernization of an existing cooking system: Increase of digester capacity and upgrade to Lo-Saltati®
ACP III Advanced Control

CIMPC Celulosa
Laja, Chile
Modernization of an existing fibeline with new screening, washing, and oxygen delignification

Jiangxi Chenoming Paper
Nanchang, Jiangxi Province, China
RT-RTS™ TMP system

Papierfabrik Altbrechts
Abbruck, Germany
Bleach plant rebuild

Economic Cell
Kunda, Estonia
P-RC™ APMP market pulp line

Pulping and sludge dewatering system for PM11, paper machine (864 t/d)

Fiber Preparation
Complete Lines & Systems
Estonian Cell
Kunda, Estonia
Flash drying system, slab press, and bailing line

Key Equipment
Norske Skog Golby
Golby, France
Extends full line TMP system
Highest throughput of 450 t/d-S3000 high-speed refiner

Panelboard
Complete Lines & Systems
Hubi Baoyuan Group
Jinlin, Hebei Province, China
Pressurized refiner system for MDF with a capacity of 456 t/d

Tissue Machines
Upgrades & Modernizations
Kimberly-Clark
Barrow in Furness, United Kingdom
Sheet transfer system and center wind reel

Paper & Board Machines
Upgrades & Modernizations
UMKA
Umita-Beograd, Serbia and Montenegro
Rebuild of folding boardboard machine

Ventilation and Drying
For Tissue and Paper/Board Machines
Key Equipment
Holmen Paper Madrid
Fuentesbrada (Madrid), Spain
PM hood and air system
Visit FiberSpectrum Online at: www.fiberspectrum.andritz.com or the main Andritz site at www.andritz.com