

PULP AND PAPER

Highlights 2005

- Solid project activity for both greenfield pulp mills and modernization/refurbishments of existing mills
- Very successful start-up of Veracel pulp mill
- Receipt of several important reference orders



The new Andritz fiberline for Veracel Celulose S.A. is among the world's largest, producing 900,000 t/a of high-brightness (up to 92 ISO), high-strength eucalyptus pulp.



Business Area Managers

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Profile

The Pulp and Paper Business Area is a leading global supplier of systems, equipment, and services for the production of pulp, paper, and Medium Density Fiberboard (MDF). The Business Area also supplies wood handling systems for the Oriented Strand Board (OSB) industry.

The Business Area's technology is employed for the production of chemical, mechanical and recycled pulp. The successful acquisition of complementary product areas over the last decade enables the Business Area to supply complete processing lines from log handling to fiber preparation to the drying, sheeting, and baling of pulp, including chemical recovery and sludge handling.

The Business Area also supplies stock preparation and paper machine approach systems, refining systems, tissue machines, and machine ventilation/drying systems for paper, tissue and board applications.

Service activities include engineered wear products (refiner plates, screen baskets, rotors, agitators, chipper knives, etc.), as well as complementary technical services. The most recent acquisitions extend the Business Area's expertise in specialized sensors, process control, and equipment condition monitoring.

The Pulp and Paper Business Area provides basic and detailed engineering, procurement, manufacturing, equipment erection, construction supervision, commissioning, and maintenance services, as well as the supply of complete installations on an EPC basis.

Market development

In 2005, project activity for pulp mill equipment was at a satisfactory level for both greenfield mills and modernization/refurbishments of existing mills. Investments in new pulp mills were again focused on the southern hemisphere (Latin America and Asia), where some new projects were awarded and planning for several others was begun. In Europe and North America, project activity focused on selective modernizations and capacity expansions.

Pulp prices developed relatively stable during 2005. The average price for Northern Bleached Softwood Kraft (NBSK), at approximately 610 US dollars per ton, remained about the same as in 2004. Solid price increases in the First Quarter were offset by weaker demand, especially from European and Chinese paper mills, during the Second Quarter. The shutdown of some Finnish pulp mills during May and June 2005 – caused by the dispute between the Finnish Forest Industries Federation and the Finnish Paper Workers' Union about the new collective labor agreement – led to a slight support of NBSK prices.

The prices for short-fiber pulp (birch and eucalyptus) increased from 520 to 600 US dollars per ton during the First Half and remained in a range between 580 and 600 US dollars per ton during the Second Half of 2005.

Business development

Sales of the Business Area developed very favorably. As a result of increased work on the high Order Backlog at the end of 2004, Sales surged to 1,032.9 MEUR, an increase of 16.8% compared to 2004 (884.6 MEUR).

EBITA, however, decreased slightly to 63.6 MEUR (2004: 64.8 MEUR). This decline is mainly due to both the execution of some large orders, which typically have slightly lower margins, as well as competitive pressures and partial project cost-overruns in some of the Business Area's Divisions.

The Business Area's Order Intake, at 1,017.0 MEUR, declined by 16.6% compared to the previous year (2004: 1,218.9 MEUR). The main reason for this decline is the very high level achieved last year, which was influenced by the receipt of a large order worth over 300 MEUR.

During May, the Veracel greenfield market pulp mill in Brazil started up very successfully and ahead of schedule. Andritz provided the complete fiberline – from digester to finished bales of market pulp – and the white liquor plant. Design capacity for the mill is 900,000 t/a. Included in the delivery is Andritz's TurboFeed® chip feeding technology, a Downflow Lo-Solids® continuous cooking system, a new CombiScreen™ combined knoter/screening unit, the largest Andritz high-efficiency DD Washers in operation, and the largest pulp dewatering and drying system in Latin America (9.338 m working width). The whole line produced 3,468 t/d just months after start-up, exceeding its design capacity of 3,000 t/d.

Major orders

A new drying machine, supplied by the Pulp Drying Systems Division to Jiang Lin Pulp Mill, China also started up successfully. The flash dryer supplied to M-real's Kaskinen mill, Finland and the dryer upgrade at Zellstoff Pöls AG, Austria also started up successfully.

The new 5.55 m wide tissue machine for Shandong Hengan Paper Co. Ltd., China started up very successfully. This CrescentFormer machine for high-quality tissue paper has a production capacity of 60,000 t/a.

The new fiber preparation pilot plant in Graz, Austria was officially opened at the end of April 2005. With the new pilot plant, Andritz will be able to perform customer trials and R&D development work on complete systems. The plant, which can be used for both single machines and system trials, is suitable for treatment of many different raw materials, such as recycled fibers, old corrugated containers, and virgin fibers.

In spring 2006, Estonian Cell, one of the most modern high-yield hardwood mechanical pulp mills in the world, incorporating the latest technology in mechanical pulping, was in its final stages of completion. Andritz supplied the technologies and process equipment for the mill, which is expected to start up ahead of schedule. A detailed project description of Estonian Cell can be found on page 53 of this report.

• Andritz will supply all the major process equipment for Oy Metsä-Botnia Ab's new pulp mill to be built near Fray Bentos, western Uruguay. The scope of supply encompasses a large single-line production system from wood handling to pulp drying, as well as the chemical recovery systems (evaporation plant, recovery boiler, and white liquor plant). The value of the order is over 200 MEUR. The mill will produce one million tons of eucalyptus pulp per year. The Andritz equipment represents the industry's latest technology and will ensure minimal environmental impact, cost-effective production, and the highest quality pulp.

The International Finance Corporation (IFC), the private sector financing arm of the World Bank, is currently evaluating to provide financing for the project. An impact study of the World Bank to assess the social and environmental impacts of the pulp mill showed favorable results, thus confirming Botnia's own study. A final decision by the World Bank is expected during the First Quarter of 2006.

Both parties also signed a long-term maintenance contract for the mill. Andritz, in cooperation with Metsä-Botnia, will be responsible for maintenance planning and implementation, as well as the complete maintenance operations after the start-up of the mill.

• Marusumi Paper, one of Japan's major integrated newsprint producers, selected Andritz to deliver a new 700 t/d fiberline and the chemical recovery systems for its Ohe mill. The value of the order is approximately 100 MEUR.

Andritz will deliver the project on an EPC basis. The scope of delivery includes a continuous digester, brownstock washing, oxygen delignification, screening, bleaching, evaporation, and a white liquor plant, including white liquor oxidation. The fiberline will operate on both hardwood and softwood to meet the raw material requirements of Marusumi's paper machines. The six-effect evaporator will be the first complete evaporator plant to be supplied by Andritz in Japan.→

Key figures Pulp and Paper

MEUR	2005	2004	2003	2002	2001
Sales	1,032.9	884.6	810.3	672.2	883.0
Order Intake	1,017.0	1,218.9	857.3	843.3	642.8
Order Backlog as of 31.12.	950.4	951.1	622.7	582.0	431.5
EBITDA	76.1	77.9	63.9	53.5	69.8
EBITDA margin	7.4%	8.8%	7.9%	8.0%	7.9%
EBITA	63.6	64.8	49.1	39.2	53.9
EBITA margin	6.2%	7.3%	6.1%	5.8%	6.1%
Capital investments	13.6	14.3	9.3	11.5	10.8
Employees as of 31.12.	3,018	2,805	2,959	2,634	2,626

In addition to these large, multi-Division orders, the following significant orders were booked by the Divisions:

The **Wood Processing Division** will supply a three-line woodyard on an EPC basis for Suzano Bahia Sul's new pulp mill to be built in Brazil. The woodyard capacity corresponds to 1.2 million tons annual pulp production. The Division received an order from Martco for portal cranes to be delivered to Louisiana, USA. Andritz wood handling systems are becoming the standard for new, high-capacity OSB plants. The Division also received a significant order from Grant Forest Products for portal cranes and debarking lines for two greenfield OSB plants in South Carolina, USA. International Paper ordered a complete debarking system with de-icing and LogScan™ automation system to increase wood cleanliness for its Bucksport groundwood mill, USA. JSC Arkhangelsk Pulp and Paper Mill, Russia extended its earlier woodyard order to add a conveying system for chips and bark.

The **Recovery Division** will supply a new High Energy Recovery Boiler (HERB) to SCA Packaging Obbola AB, Sweden. The technology concept and features of the recovery boiler to be delivered by Andritz will meet SCA's targets to further reduce emissions and to maximize power production, doubling the electricity generated at the plant.

International Paper do Brasil's Mogi-Guacu mill, Brazil, Nettingsdorfer Papierfabrik AG's mill in Haid bei Ansfelden, Austria, and Australian Paper Limited's Maryvale mill, Australia have ordered recovery boiler retrofits. Tamil Nadu Newsprint and Papers Limited, Kagithapuram, India placed an order for a new recovery boiler through Andritz's joint venture in India, Enmas-Andritz. Smurfit-Stone Container in South Carolina, USA ordered a new EPC seven-effect evaporation plant. April Desa Pangkalan Kerinci, Indonesia ordered a new evaporation plant which will produce high dry solids liquor. Incorporated in the delivery will be two concentrators to upgrade the existing evaporation plants to produce 80% dry solids. M-real selected the Division to upgrade the evaporation plant at the Husum mill, Sweden, and VCP's Jacarei mill, Brazil ordered an upgrade of its evaporation plant.

The **Chemical Systems Division** will supply the white liquor plant at CENIBRA's Belo Oriente mill in Brazil. A new technology LMD-Filter™ is being installed at Sappi Fine Paper North America's Somerset mill, USA. This represents the latest technology for lime mud dewatering. The Division was awarded a significant order for a white liquor plant (recausticizing plant, excluding green liquor handling and lime kiln) by Zellstoff Pöls AG, Austria. The Division's market presence in India was further strengthened with the orders for two new lime kilns.

The **Fiberline Division** will supply systems for washing, oxygen delignification, screening, and bleaching to Sirpur Paper Mills, India. The systems will produce pulp from mixed hardwoods and bamboo. This is the second large order from the Indian market in 2005. The Division also received three orders from Brazil to upgrade cooking systems: Votorantim Celulose e Papel's mill at Jacarei, CENIBRA's mill at Ipatinga, and Aracruz Celulose's Fiberline B. All three upgrades include the yield-enhancing Lo-Solids® cooking technology as the main technical component. The upgrade at Jacarei will create the world's largest capacity single-line cooking system (3,740 t/d). Also in Brazil, the Division will supply the washing, screening, oxygen delignification and bleaching systems on an EPC basis to Bahia Sul Celulose's Mucuri mill. The capacity of the line, which will include the largest DD washers Andritz has ever built, is 3,160 t/d. The Division will supply Australian Paper's Maryvale mill, Australia with the major equipment and services for a cooking system modernization (Lo-Solids® cooking) and new systems for brownstock screening and washing, oxygen delignification, and bleaching.

The **Pulp Mill Services Division** received numerous orders for services to improve customers' overall efficiency. The Division signed a large contract with Metsä-Botnia to work as partners for maintenance planning and execution of a new pulp mill being built in Uruguay.

The Division engaged in several significant fiberline modernization projects: upgrading of an atmospheric diffuser for Ilim Group's Ust Ilimsk mill, Russia and of the digester feed system for Stora Enso's Norrsundet mill, Sweden. One of the biggest orders from Japan was received from Chuetsu's Nomachi mill for upgrading its ECF bleaching line. UPM's Kaukas mill, Finland ordered a large package of services encompassing fiberline, evaporation, recovery boiler, and recausticizing equipment. This order demonstrates Andritz's capability to perform mill-wide shutdown services for its customers.

The **Fiber Preparation Systems Division** received orders for components for the deinking line, paper machine approach system, and sludge dewatering system from Guangzhou Paper, China. The pulping equipment is designed for 1,200 t/d capacity. The deinked pulp will provide the furnish for a new newsprint machine. Orchids Paper Products, USA placed an order for a recycling paper line and approach flow system upgrade for tissue production.

The Division received major orders for OCC systems from An Binh Paper, Vietnam and Middle East Paper, Saudi Arabia. In addition, the Division received orders from Shandong Huatai, China for pulping and sludge dewatering systems for the new PM12 deinking line. UMKA AD Fabrika Kartona, Serbia and Montenegro ordered an upgrade for its existing recycled fiberline that supplies an eight-layer board machine. Andritz will also rebuild a board machine at the mill to increase capacity by 50%. JSC JTI Yelets, Russia ordered equipment for a tobacco processing plant. The Fiber Preparation Systems Division has built up a strong local team in China to sell and execute local projects for deinking, approach systems, and OCC recycled fiber systems using the local manufacturing resources at Andritz Technologies China.

The **Mechanical Pulping Division** signed the largest contract in its history with Tracodi Corp., Vietnam to supply a complete chemi-mechanical pulp production line – from raw material received to finished packed pulp bale. The line will be based upon Andritz's P-RC™ APMP technology. This will be the first time that kenaf will be used as a raw material for mechanical pulping. The scope of supply also includes auxiliary systems such as instrumentation, process control, and wastewater treatment.

Solikamsk OAO, Russia has contracted with Andritz to rebuild its TMP line to increase capacity and improve the pulp quality. In addition, the Division received an order to supply bleach plant equipment to Norske Skog's Boyer mill, Australia. The new bleaching line will meet the high brightness required for improved newsprint grades. Orders for single machines and bleach plant upgrades were received from SCA Laakirchen, Austria and MD Albruck Myllykoski, Germany. Nippon Paper's Iwanuma mill, Japan ordered a new RTS™ high-speed refiner to reduce energy consumption while producing high consistency pulp.

For the MDF industry, the Mechanical Pulping Systems Division upgraded the existing pressurized refining system of Kunz Faserplattenwerk Baruth, Germany, which created the world's largest single-stage production line (over 1,300 t/d). The Division sold MDF pressurized refining systems to Fibraplac Chapas de MDF, Brazil and Neopan Bartar, Iran. A high-capacity pressurized refining system was sold to Yıldız Sunta MDF, Turkey. In addition, the Division received two orders from Chinese MDF producers and two orders for upgrades of existing pressurized refining systems from Egger, Germany for its plants in Wismar and Brilon. The Division will also supply a plant to convert waste plastics into a valuable raw material which can be used in the fiberboard industry. This will be the first of its kind in the world, and a completely new technology.

The **Pulp Drying Systems Division** received an order for a pulp drying plant from Guizhou Chitianhua Paper Industry, China, which will be the third market pulp drying plant from Andritz in China. The Division also received orders from Carter Holt Harvey, New Zealand for a Twin Wire Press to replace older equipment and provide extra capacity. Andritz will supply a slab press, baling line, and flash drying system to Phuong Nam, Vietnam utilizing the latest technology in bale forming and drying developed by Andritz. Contracts were also received for the extension of a Fläkt dryer at Weyerhaeuser's Port Wentworth mill, USA and for another customer in North America. Pulp Drying Systems will upgrade a drying system and deliver a new screening plant for Zellstoff Pöls AG, Austria, which will replace the existing cleaner system to achieve better pulp cleanliness with lower energy consumption. In addition, the Division will modernize a pulp machine – originally supplied by Andritz – for Indah Kiat's Perawang mill, Indonesia, adding a capacity of 150 t/d, and the baling line for M-real's Kemsley mill, UK. Also, an order was received for a production upgrade of a Fläkt dryer for CENIBRA, Brazil.

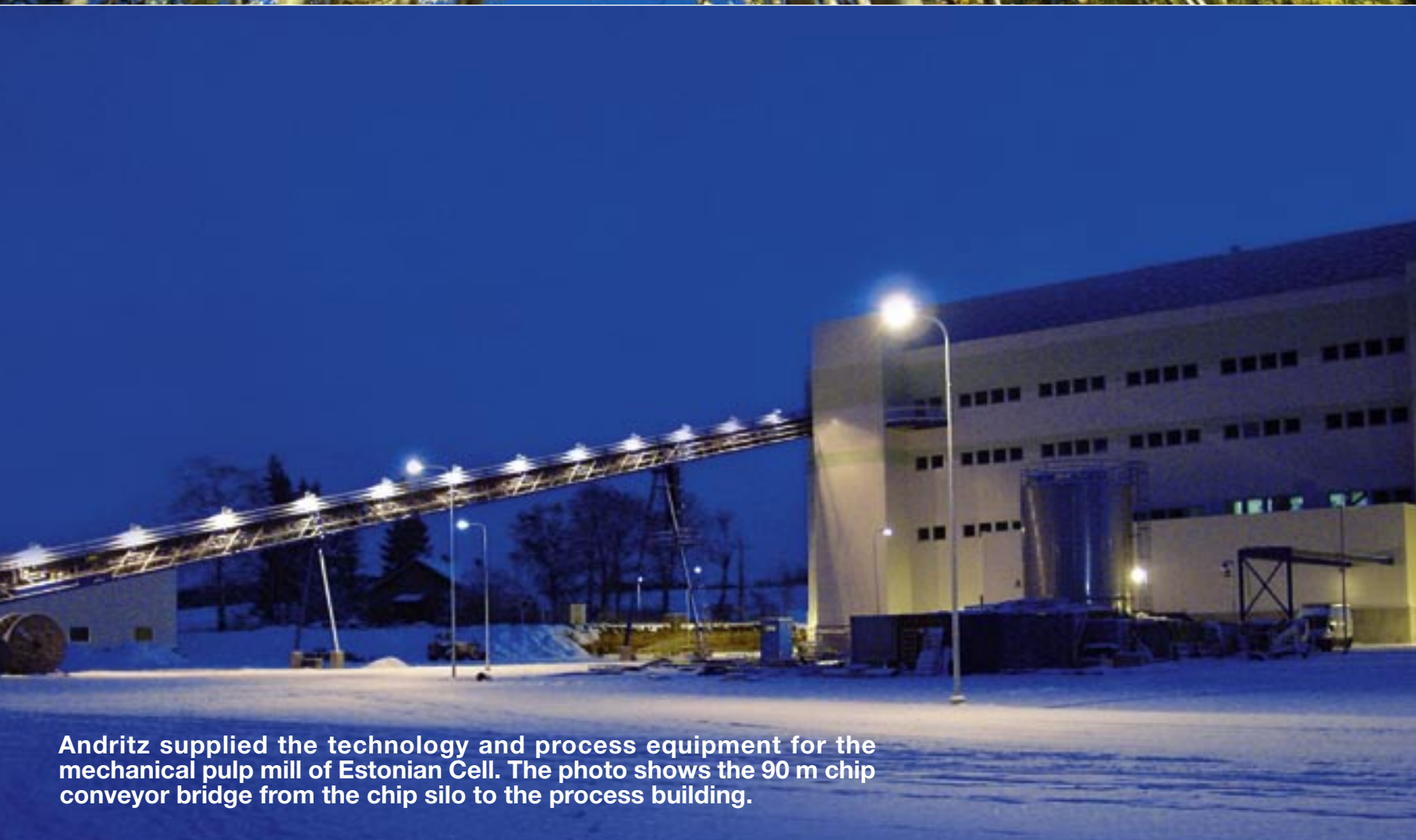
The **Tissue Machines Division** received an order for a new TAD machine from Procter & Gamble's (P&G) Green Bay mill, USA. The tissue and towel machine is part of a capacity expansion at the mill. P&G also selected Andritz to upgrade the dry end of a tissue machine at its Neuss mill, Germany. This is the third contract with P&G for a machine modernization at Neuss within a year.

The **Paper Mill Services Division** focused its efforts on automation systems and the development of programs combining parts deliveries and annual service contracts to improve the equipment availability and overall production efficiency of customers' plants. The Division received orders for upgrades of refiner protection systems from Norske Skog mills in Walsum, Germany and Halden, Norway. These systems provide higher availability and improved stability of refining operations.

The screen basket business developed very successfully. Major orders, including corporate contracts, were received from Rock Tenn, USA, Polesine, Italy, and Swiecie, Poland, and from several Chinese mills. The refiner plates business was very successful in spite of some mill closures, particularly in North America. The introduction of plates for conical refiners led to a number of orders. A recycled fiber pulper for Polesine, Italy was rebuilt to improve pulping efficiency at higher production levels. This confirms the expertise of the Division for pulper rebuilds. Several major upgrades of dewatering equipment were completed during the year to increase production rate and reduce energy consumption. Upgrades were performed in Norway, Canada, China, Great Britain, Switzerland, Austria, and Brazil. The Division modernized the mechanical pulping line at Perlen Papier, Switzerland to increase capacity for PM4. UPM Lappeenranta, Finland and Kathadin Pulp, Canada utilized the Division's services for large-scale refurbishment of their mechanical pulping lines.



Aspen trees are the raw material for the Estonian Cell pulp mill. All state-owned forests in Estonia have been certified by the Forestry Stewardship Council (FSC) since 2002.



Andritz supplied the technology and process equipment for the mechanical pulp mill of Estonian Cell. The photo shows the 90 m chip conveyor bridge from the chip silo to the process building.

ESTONIAN CELL

High-Yield, High-Quality Pulp in Estonia

Andritz supplied to Estonian Cell a complete mechanical pulp mill – from woodyard to finished pulp bales.

Extensive environmental impact studies, and creation of several hundred new jobs.

The new Estonian Cell pulp mill is based near Kunda, Estonia, about 100 km east of Tallinn. Andritz supplied the technology and process equipment for the mechanical pulp mill of Estonian Cell – from woodyard, chip handling, impregnation, refining, bleaching, dewatering, and drying to finished pulp bales. The mill uses the advanced and well-proven Andritz P-RC™ APMP technology, which lowers operating costs and improves pulp quality due to reduced energy consumption (20-30%) at similar chemical charges. It also improves the bio-degradability of effluents (no sulphur compounds) and leads to better mechanical characteristics of the pulp.

Estonian Cell is designed to produce 140,000 t/a of high quality market pulp. The main focus markets are Western Europe and Scandinavia. The bleached pulp from aspen fiber is ideal for papermaking applications ranging from printing and writing grades to paperboard and tissue.

Abundant hardwood resources, especially aspen, in Estonia and attractive energy and labor costs were the driving forces to promote the idea of building a pulp mill in that region. All state-owned forests in Estonia (1 million ha or 40% of all forested land in the country) have been certified by the Forestry Stewardship Council (FSC) since 2002. The mill provides employment for approximately 75 full-time people and created several hundred new jobs in the surrounding area (support services, outsourced services, etc.).

Before the mill was built, an extensive environmental impact study had been carried out for the Estonian authorities. The resulting permit covered the environmental performance of the entire plant (emissions to air, effluent to water, generation of wastes, noise) and followed the European Union's recommendation for the best available technologies.

The general contractor for the project is German RWE Industrie-Lösungen GmbH, which signed a sub-contract for supply of the main process equipment with Andritz in April 2004. Erection works started in March 2005. Andritz completed classroom training for Estonian Cell's operations and maintenance personnel in autumn 2005. The operators did hands-on training at an Andritz P-RC™ APMP mill in China.

This project once again confirms Andritz's position as the global leader in hardwood mechanical pulping. During 2005, several similar Andritz lines started production and others are currently under construction.

The Estonian Cell project is financed by Larvik Cell AS of Norway, the European Bank for Reconstruction and Development, and the Heinzl Group of Austria. Heinzl will also be responsible for marketing and selling Estonian Cell's market pulp.

Research and Development

The Divisions have focused their R&D programs primarily on improving fiber quality while lowering investment, operating and maintenance costs, and also reducing environmental impact of the equipment and processes.

The trend today is towards large, single-line mills, since redundant or repetitive smaller systems increase both capital and operating costs. This places extreme demands on the equipment in terms of scale, reliability, and availability. All Andritz Divisions are actively developing larger scale equipment.

The Divisions' R&D programs in detail are as follows:

Wood Processing

The main focus was on large-scale field-testing new developments at customer locations. The new chip sampling system was started up and automatically produced representative chip samples for the analyzer. This provides chip quality information for use by pulp mill operators.

Full-scale tests of debarking behavior of tropical hardwoods were carried out in southern Europe. The tests generated important information about the correct debarking parameters. Tests of a new method for removing loose bark from hardwoods were successful. In North America, a new monitoring and diagnostics package for portal cranes, which will improve the overall efficiency of the equipment, was developed.

Fiberline

Developments are continuing in the program to reduce customers' overall costs while maintaining equipment performance and availability. The adaptation and improvement of process and equipment solutions for southern hemisphere applications are also progressing. These developments are not only related to scale-up of the production capacity for extremely large mills, but also to the development of cost-competitive solutions for small and medium-size mills.

New developments of the Drum Displacer™ (DD) Washer show remarkable progress with regard to washing efficiency and capacity. The best proof for these improvements is visible in the start-up curves and chemical consumption figures of recent deliveries. The next generation of MC equipment is under intensive development with the goal of system simplification and energy savings.

In the area of modeling and simulation development, the first Advanced Control Systems (ACS) were sold to VCP in Brazil and CMPC in Chile to optimize the digester operations. Development work continues to include the remaining fiberline process areas.

Recovery

Further development of black liquor crystallizing technology is underway to extend the time between concentrator washouts and to improve evaporator availability.

The first Ash Re-Crystallization (ARC) system for chloride and potassium removal was successfully commissioned at the Portucel Soporcel Group mill in Portugal. During the start-up, a new computer model for simulating the ARC process and leaching processes was tested.

Research has been conducted on evaporator materials. Electro-chemical testing of the corrosion resistance of different materials has been performed in a mill environment. In addition, through heat transfer material research, the Division has found more cost-effective materials for evaporators. Development of manufacturing and welding procedures for lamellas is an important part of the research. The study is being conducted in cooperation with technical universities and material producers.

Developments for recovery boilers are focused on producing more power from biofuel (black liquor), which also eliminates the release of greenhouse gases into the atmosphere. A new arrangement of heat transfer surfaces in the upper furnace of the recovery boiler is implemented in three new recovery boilers now under construction. This will enable more effective utilization of flue gas heat to produce higher pressure steam in the boiler.

Chemical Systems

A new lime kiln burner has been developed, and is now successfully operating at a mill in Finland. The burner produces lower nitrogen oxide levels than existing technology.

A centrifuge for green liquor dregs handling is being marketed. It offers advantages for mills which carefully manage non-process element removal in the lime circulation.

A new concept for lime mud drying has been developed and a patent has been applied for. The new technology should enable customers to increase the capacity of existing kilns with lime mud dryers or reduce the size of a new lime kiln for a given capacity.

The first LMD-Filter™ for lime mud dewatering and washing has exceeded performance expectations. Two units are in operation and seven units were sold. Developments are continuing to design larger sizes of all major equipment in the white liquor plant (4,000 t/d pulp production and 14,000 m³/d white liquor production).

Pulp Mill Services

Life cycle management and optimization have been the Division's focus areas during the last few years.

For the woodyard, a service has been developed to optimize chipping operations efficiency and control. The offering is a combination of equipment (HQ-Plus™ chipper knife system), service, and automation (Acutest® condition monitoring and the new chip sampler/analyzer).

In the chemical recovery area, cast air nozzles, mini-hoods, and smelt shattering systems in the recovery boiler improve equipment availability and extend the time between shutdowns.

A new product group, Automation & Diagnostics, is responsible for developing and managing automation technology – including condition monitoring, simulation, process control, and optimization.

Fiber Preparation Systems

In the Fiber Preparation Systems Division, Andritz can now perform full-line production trials and testing for recycled fiber applications in its Graz pilot plant. The plant is capable of receiving customer raw materials, processing the fibers (including deinking if necessary), and producing the final pulp. Future research work will concentrate on different aspects of residuals (sludge/rejects) and water handling technologies to further reduce environmental impact.

Mechanical Pulping

Technologies and equipment to process alternative raw materials (different species of pine, a variety of hardwoods, and annual plants) have been developed.

In chemi-mechanical pulping, development has concentrated on mill-scale optimization of the advanced P-RC™ APMP process. Results that had been achieved in pilot plant work were confirmed or surpassed in actual mill operation.

New pre-treatment and high-consistency refining technologies were developed to allow for the use of alternative wood species in the RTS™ TMP process. Pulp of very high quality have been produced with these processes and specific energy consumption has been reduced by 20–30% compared to standard TMP.

Major drivers in equipment development are productivity improvements and increased production capacities. Following these requirements, new machine sizes with larger capacities were introduced to the market. Availability and ease of maintenance for refiners and dewatering machines have been improved. New methods to increase replacement intervals of refiner plates have been successfully introduced.

Customer requirements include sophisticated process control. The new Andritz Bleach Commander™ uses modeling and predictive control strategies to better control the bleaching process – minimizing quality deviations and maximizing the production of “on-grade” pulp. Chemical consumption is optimized to the target brightness, which reduces bleaching costs.

Pulp Drying

Technology development in the Pulp Drying Division continues to focus on lowering the investment cost per ton of pulp produced. The main R&D thrust is to produce a single drying line with production of 4,000 t/d based upon successful Twin Wire Former technology. The related specific design capacity was reached on the Division's full-scale pilot machine. In addition, development is underway to continually improve the machinery's up-time through easy/fast sheet threading and process condition monitoring.

A highly sophisticated process simulator for the entire sheet drying line has been developed. This is used for operator training and DCS checkout prior to start-up. This simulation approach ensures fast production ramp-ups after the line is started. The simulator also contributes to continuous optimization of the plant.

Work on the new slab press was completed, giving Andritz full-line capabilities for mechanical market pulp mills. The first commercial installations of this press were at Estonian Cell, Estonia and Phuong Nam, Vietnam.

Tissue Machines

For optimum “hands-on” operator training, the Tissue Machines Division developed a tool to provide dynamic simulation of all mass and energy flows in a tissue or TAD plant. Operators can virtually run the future paper production line and change settings in a safe, virtual environment.

The shoe press technology has been proven in 13 tissue machine installations around the world. One of its latest features is “machine direction” shoe movement. This additional functionality results in gaining more bulk or achieving higher post-press dryness, giving the operator more flexibility. Record speeds of over 1,900 m/min have been achieved with a shoe press.

A further development of the reel concentrated on the improvement of the centerwind. A centerwind reel is mainly used in TAD machines to retain the volume and water absorption properties for bulky heavyweight tissue and towel grades. The new PrimeReel™ Centerwind controls very low nip loads sufficient for crease-free winding. Furthermore, it allows winding of larger diameter rolls to increase productivity.

A stable sheet transfer in the area between the creping doctor at the Yankee cylinder and the reel is critical to runability. The PrimeRun™ system of sheet transfer components ensures better runability, especially with lightweight tissue at high machine speeds.

Paper Mill Services

A new wedge wire basket with the brand name BarTec™ was successfully introduced, with a focus on optimization of the screen basket production process and the application of new profile types and wires to ensure highest quality and maximum stability.

Building on the LemaxX Spiral™ success in Andritz/Durametal's core Double-Disc refiner plate business, the low consistency product line is now pursuing growth in the conical refiner plate market. The first field trials of LemaxX Spiral C™, the latest development for the high performance, value-added conical market, have proved very successful; product launch is expected during 2006.

Development programs were designed for Bauer Double Disc Refiners in order to address the seal and bearing problems of those machines. They are a guideless and trammable rebuild kit for the Twin 60 to ensure parallel plate gap over the service life, and a Keraloy hard facing product to increase service life of compression plug screws (MSD, chip press, etc.).

The modern Refiner Protection System (RPS) developed from Andritz was upgraded with additional security functions. Furthermore, it was improved in a way to enable the condition monitoring with this system.

New SCP wear shoes for both the high pressure and the low pressure zones were developed, targeting increased lifetime and thus reducing maintenance costs on screw presses. The new wear shoes are available for all Andritz and competition screw presses.