



BUSINESS AREA MANAGERS



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PULP AND PAPER

Chemical recovery plant

Andritz supplied UPM-Kymmene's Wisaforest mill in Finland with one of the world's largest single-line chemical recovery plants. The chemical recovery island consists of an evaporation plant (photo), recovery boiler, recausticizing plant, and lime kiln. Andritz chemical recovery systems fulfill the most stringent environmental requirements. The Wisaforest project started successfully on time in April 2004.

PROFILE

→ The Pulp and Paper Business Area is a leading global supplier of systems, equipment, and services for the production of fiber, for chemical recovery, and for sludge dewatering/handling in pulp, paper, and Medium Density Fiberboard (MDF) mills. The Business Area's technology is employed for the preparation of chemical, mechanical, and recycled pulp for all grades of paper, board, and tissue. The Business Area also supplies stock preparation and machine approach systems, tissue production systems, machine ventilation/drying equipment, sheet dewatering/drying/baling systems for market pulp, and flash drying systems and slab presses for fluff pulp. The Business Area's service activities include engineered wear products (refiner plates, screen baskets, pulpers, rotors, chipper knives etc.), as well as complementary technical services.

The successful acquisition of complementary product areas over the past few years enables the Pulp and Paper

Business Area to supply complete processing lines from log handling to the production, drying, sheeting, and baling of pulp. The most recent acquisitions extend the Business Area's expertise in specialized sensors, process control, technologically advanced wear products, 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 EPC contracts.

The Business Area has service and sales locations in each major market. In the emerging regions of Asia and South America, Andritz has built upon its strong foothold with local service centers and excellent reference deliveries.

Market development

In 2004, the international pulp markets and the related equipment market showed satisfactory development. Major project activity developed favorably throughout the reporting period, with investments and greenfield projects mainly concentrated in the southern hemisphere. In Europe and North America, investments focused more on modernizations and capacity expansions of existing pulp mills.

The capacity levels of market pulp producers increased modestly for mechanical pulp producers and more substantially for chemical pulp producers. Underlying demand for pulp remained strong during 2004. Pulp prices are denoted in US dollars, whose value decreased significantly against the Euro and other major currencies during 2004. This forced Canadian and Euroland producers to

raise the minimum price level for market pulp, leading to increasing pulp prices.

Capacity utilization of international pulp producers was relatively stable and at a very high level. In the First Half of 2004, the price for Northern Bleached Softwood Kraft (NBSK) pulp increased significantly. Due to strong demand and unchanged supply, the price went from approximately 560 US dollars per ton in January 2004 to approximately 650 US dollars per ton at the end of June 2004. However, due to slight oversupply and seasonal temporary shutdowns of several paper manufacturers, the pulp market weakened during the Second Half of 2004, especially during the Third Quarter. Towards the end of the year, the price started to increase again as a consequence of increased demand.

The market for short fiber pulp (birch and eucalyptus) developed in step with the price development of NBSK.

Business development

The financial results developed very favorably during the reporting period. As a result of increased execution of some major orders and the growth of the services business, Sales increased by 9.2% to 884.6 MEUR (2003: 810.3 MEUR).

Due to increased Sales, the favorable development of the services business and continued cost optimization measures, EBITA of the Business Area surged 32.0% to 64.8 MEUR in 2004 (2003: 49.1 MEUR). Profitability expressed as EBITA margin increased from 6.1% in 2003 to 7.3% in 2004.

The integration of Fiedler GmbH of Germany acquired in September 2003 progressed very favorably in 2004. This acquisition made Andritz one of the leading global suppliers of screen baskets and rotors. A result of the synergies is the new wedgewire screen basket – the Bar-Tec™ Wedgewire – which utilizes the strengths of the Andritz FiberSentry™ and the former Fiedler Strong-Bar®. The new basket will be introduced to customers in the First Quarter of 2005.

Andritz and Rheinhold & Mahla AG of Germany, a leading provider of industrial services in Europe, formed a joint venture (European Mill Service GmbH) to provide a broad range of industrial maintenance services and long-term maintenance contracts for pulp, paper, and panelboard mills in Europe. This is consistent with customer requirements to increasingly outsource support services, such as maintenance, to competent external suppliers.

Andritz strengthened its ability to serve the growing market in Chile by providing local contact points with Chilean customers. A new office for capital sales and project management was established in Santiago. Andritz also enlarged the service office in Concepción. The office now provides spare parts sales, field services, technical assistance, and the sale of engineered wear parts for pulp mills, paper mills, and MDF plants in Chile.

Following a successful period of joint research, development, and marketing in the field of tissue machines, Andritz and Voith have decided to change their existing cooperation. As part of this, Voith Andritz Tissue LLC, Janesville, WI, USA, the joint venture company which was founded to serve the NAFTA tissue market, will continue as

KEY FIGURES PULP AND PAPER

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

Andritz Tissue Inc., supplying tissue machines to US, Canadian and Mexican customers with the same tissue professionals. Andritz Tissue Inc. will be a 100% affiliate of Andritz in 2005, as part of the Tissue Machines Division.

The large single-line chemical recovery plant supplied by Andritz for Wisapower at UPM-Kymmene's Pietarsaari mill in Finland started very successfully in early April. Guaranteed production was achieved after only five days, and a new record for pulp production was reached within a week of operation. Andritz's delivery included a new recovery boiler, evaporation plant, and white liquor plant.

Andritz chemical recovery systems were successfully started up in July at Mercer's Zellstoff Stendal mill, a greenfield Kraft pulp mill constructed in the Saxony region of Germany. Andritz supplied the black liquor evaporation plant, the chemical recovery boiler, and a complete recausticizing system for the production of white liquor. The Stendal mill is fulfilling the most stringent environmental requirements.

In 2004, the Business Area booked a record level of orders. At 1,218.9 MEUR, Order Intake increased by 42.2% compared to 2003 (857.3 MEUR). The surge is mainly due to the receipt of the large order from CMPC Celulosa S.A., worth approximately 320 MEUR.

Major orders

- The largest single order ever received in the Group's history was the contract signed in September with CMPC Celulosa S.A. to supply a complete fiberline – from digester to finished bales of market pulp – and chemical recovery systems for a new pulping line at the Santa Fe, Chile mill.
- Andritz will provide the systems for pulp production and pulp drying/baling – as well as the chemical recovery boiler and white liquor plant. All systems will be delivered on an EPC basis. In addition, CMPC ordered two high-efficiency multi-stage DD Washers and oxygen delignification equipment from Andritz for their Laja, Chile mill.
- Celulosa Arauco y Constitución ordered a woodroom, recausticizing, and lime kiln for its new Itata mill in Chile.
- Estonian Cell selected Andritz to deliver a complete hardwood chemi-mechanical pulp mill from the woodyard to the finished pulp bales. The greenfield mill will be built in Kunda, Estonia.
- In Russia, Andritz will supply a complete wood and chip processing installation for SC Arkhangelsk Pulp and Paper Mill.

- Andra Pradesh Paper Mills of India (APPM) ordered a new fiberline, chemical recovery island, and woodyard upgrade from Andritz to increase pulping capacity at its Rajahmundry mill. The new fiberline incorporates the most modern, efficient, and environmentally-friendly technologies in the Indian market.
- In Canada, Irving Pulp & Paper ordered a complete lime kiln system. This is the first LMD lime kiln system to be installed in Canada.
- Andritz High Energy Recovery Boiler (HERB) technology, proven at the successful Pietarsaari installation of UPM-Kymmene in Finland, is quickly gaining acceptance as the technology of choice. New recovery boilers utilizing HERB technology have been ordered by SCA in Sweden and Weyerhaeuser in the USA.
- JSC Kotlas Pulp & Paper ordered a new six-effect evaporation plant. This is the first completely new evaporation plant to be installed in Russia in over a decade.
- Based upon their positive experience with the Andritz OPE® (Overall Production Efficiency) service contract for the white liquor plant at their Joutseno mill in Finland, Metsä-Botnia expanded Andritz's scope to include the entire fiberline.
- As a result of its excellent reputation in MDF, Andritz received 14 additional orders during the year for refining systems – eleven from China, two from Russia, and one from Austria.
- Andritz sold two P-RC™ APMP mechanical pulping lines to Jiaozuo and Ningxia Meili in China, a refiner system to Norske Skog in Brazil, a complete RTS™ line to Germany, and an upgrade of conventional Thermo-Mechanical Pulping (TMP) to RTS™ energy-saving technology to Norske Skog in France.
- Andritz will provide the complete chip impregnation system and a complete bleaching, washing, and drying line for M-real's new BCTMP mill to be built in Kaskinen, Finland.
- Fiber preparation systems were sold to Holmen Peninsular of Spain, Shandong Huatai of China, and Perlen Paper of Switzerland. The strong market position of the FibreFlow® Drum was underscored by additional orders from the USA, Korea, Finland, Spain, and China.
- Andritz will supply another CrescentFormer tissue machine and stock preparation equipment to Hengan in China. This is the third consecutive installation of an Andritz machine by Hengan. The ICT Group of Italy has also ordered a CrescentFormer machine and stock preparation for its greenfield mill to be built in Spain.

PROFILE

→ The Wood Processing Division is a global market leader for the supply of systems, equipment, and processes for all steps required in a woodyard — from receiving logs to their subsequent preparation into wood chips — for the production of chemical and mechanical pulps.

The Wood Processing Division is based in Hollola, Finland and also has operations in Brazil, Canada, Sweden, and the USA.

Business development

Business activities in the Wood Processing Division progressed favorably during 2004. The Division succeeded in maintaining its leading position in the major markets of Northern and Central Europe, South America, China, Canada, and the USA.

The woodyard at Celulosa Arauco y Constitución S.A.'s mill in Valdivia, Chile reached full production on schedule early in the year. A successful start-up was also conducted for the wood and chip processing plant at Hainan Island, China. In the USA, a tree-length debarking line was successfully started for Weyerhaeuser's Valliant, Oklahoma mill; a stacker/reclaimer was started for Interstate Paper's Riceboro, Georgia mill; and a circular crane and chipper modernization project was successfully completed for Weyerhaeuser's Oglethorpe, Georgia mill. The first HHQ™ chipper in the USA was successfully started up for Sappi Fine Paper's Cloquet, Minnesota mill.

Major orders

- The Division booked an order for a complete wood and chip processing installation in Russia for SC Arkhangelsk Pulp and Paper Mill.
- The Division received a significant debarking and chipping order from Celulosa Arauco y Constitución's Itata mill in Chile.
- The Division will deliver TMP wood handling systems to three mills in China: Shandong Huatai Paper Co., Henan Jiaozuo Ruifeng

Forestry & Paper Co., and Shandong Zhongmao Shengyuan. Also, several Chinese MDF mills confirmed the Division's expertise by ordering wood handling systems.

- The Division will deliver a wood handling system to Estonian Cell that will be integrated with mechanical pulping systems from other Andritz divisions.
- Portal crane and circular crane orders have been received in Canada from Slocan-LP OSB Corp. and in the USA from Weyerhaeuser. Weyerhaeuser also ordered tree-length debarking lines for two mills in the USA.

DIVISION MANAGER



Jarmo Viiala
Hollola, Finland

Research and Development

Joint R&D with customers is an essential step in product development when implementing new technologies and applications. During 2004, two major agreements were signed for the Division to conduct full-scale product tests at customer sites.

The first is a cooperation project with a customer in Northern Europe for chip sampling and analysis. Representative chip sampling and reliable analysis are critical elements in chip quality monitoring.

In Southern Europe, a project is underway to test the Division's RotaBarker™ debarking technology on tropical hardwood.



Chipping plant

Andritz supplied a complete four-line chipping plant to Jiang Lin pulp mill, Hainan Island, China. The Andritz Chip Quality Package includes chipping with HQ-Chipper™, chip screening with JetScreen™, and processing of oversized chips with HQ-Sizer™.

PROFILE

→ The Fiberline Division is one of the world's leading suppliers of systems, equipment, and processes for the production of chemical pulp. Products include continuous cooking systems, brownstock washers and screens, bleaching systems, and related equipment.

The Division is headquartered in Kotka, Finland and also has operations in Brazil, Japan, Sweden, and the USA.

Business development

A modernization of the continuous cooking system for Lwarcel Pulp in Brazil was successfully started up. The project included installation of a Lo-Level® chip delivery system, a Lo-Solids® cooking technology upgrade, and a retrofit of the digester.

Four projects involving Drum Displacer® (DD) Washers were started up in Russia, Portugal, South Africa, and the USA.

The Division started up three sawdust digesters (Canada, Indonesia, and Finland). The deliveries in Indonesia and Finland also included screen rooms and DD Washers.

While Western European market activity was light, activity in the Russian market continued to improve. The North American market activity for upgrades and system replacements continues at a modest pace. The most active market continues to be South America, including system modernizations, and capacity expansions of existing and new mills. Sales activity for system upgrades and mill expansions in Japan, China, and Southeast Asia continues to be promising.

Major orders

- The Division will supply a major portion of the order received from CMPC Celulosa S.A. in Chile. Included is a complete EPC fiberline (capacity: 2,405 t/d) with a two-vessel Lo-Solids® digester, TurboFeed™ chip feeding, high-efficiency DD Washers for washing and bleaching, and the patented A-stage bleaching process for reduced chemical consumption.

- In addition, the Division will deliver high-efficiency DD Washers and oxygen delignification equipment for CMPC's Laja, Chile mill.

- Andhra Pradesh Paper Mills (APPM) in India ordered a new fiberline to increase pulping capacity at its Rajahmundry mill. The new fiberline will consist of a DownFlow Lo-Solids® cooking system, brownstock washing with DD Washers, two-stage oxygen delignification, deknottting/screening, and ECF bleaching with DD Washers.

- In North America, the Division sold a four-stage DD Washer to a Weyerhaeuser mill in Wisconsin and a Lo-Solids® cooking upgrade for a digester to another major customer. The Division was also selected to supply a customer in the Southeastern USA with systems for brownstock

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Jukka Sainiemi
Kotka, Finland

screening, washing, and oxygen delignification using the proven DD Washer technology.

- In China, the Division sold a screening system to Shandong Zhanhua Jingbo.
- In Brazil, Lwarcel Pulp ordered the machinery and engineering services for a new washing, screening, and bleaching line.
- In Estonia, Horizon Paper ordered a four-stage DD Washer for brownstock washing, a knot separation system, and advanced process controls from the Division.

Research and Development

Technology development in the Fiberline Division continues to focus on lowering the investment cost per ton of pulp produced. This is being accomplished through process simplification, optimization, standardization, and modularization.



Bleach plant

This ECF bleach plant was supplied for the 1,900 t/d hardwood fiberline at Stora Enso's Imatra mill in Finland. The delivery also included brownstock washing, oxygen delignification, and deknottling/screening.

TurboFeed™ has made the breakthrough and is today the standard solution in chip feeding systems into the digester. The new developments of the DD Washer show remarkable progress with regard to reliability, washing efficiency, and capacity. These improvements are available for modernizations and upgrades of existing lines, in addition to new fiberlines.

Recent start-ups and sales of the new coarse/fine screening systems (combined unit) is a clear indication of market acceptance of this new product. The combined unit further reduces screen room costs.

The Division is also continuing to focus development efforts on MC® based technology throughout the fiberline. Research is ongoing in the development of fiberline processes for Southern hemisphere wood species. Sophisticated simulation programs are being utilized to improve upon washing and cooking technologies. Advanced control systems for all of the fiberline process areas are being developed and tested.

PROFILE

→ The Chemical Systems Division offers solutions for pulp mill on-site chemical preparation. The main process areas served by the Division are recausticizing, lime reburning, and white liquor production.

The Division is headquartered in Kotka, Finland and also has operations in Brazil, Indonesia, Japan, Sweden, and the USA.

Business development

The Division's business activities progressed very favorably during 2004. Major business activities were in the Southern hemisphere, although modernizations of equipment have stimulated business in market areas worldwide.

The recausticizing plant and lime kiln for Arauco's Valdivia mill in Chile were successfully started up in March. In April, the chemical recovery island at UPM-Kymmene's Pietarsaari mill in Finland went online. Included in this project was the world's largest single line white liquor plant (10,000 m³/d) supplied by the Division.

At the end of July, the 8,000 m³/d white liquor plant for Zellstoff Stendal in Germany was successfully started up. This greenfield project includes two CPR-Filter™ systems for lime mud filtration.

In the Fourth Quarter, new X-Filter™ systems for green liquor filtration were started up at Södra's Mörrum mill in Sweden.

Major orders

- The Division received its largest order ever as part of the multi-Division order from CMPC Celulosa S.A. in Chile. For the Santa Fe mill, the Division will supply a complete EPC white liquor plant (including lime kiln).
- The Division received an order from Complejo Forestal Industrial Itata to deliver a complete white liquor plant, including recausticizing and lime reburning.

DIVISION MANAGER



Markku Kosonen
Kotka, Finland

- The Division was chosen to modernize a lime kiln for Billerud Skärblacka, Sweden.
- In India, the Division will provide a CD-Filter™ for white liquor, an LMD-Filter™ for lime mud, and a lime kiln burner as part of the capacity expansion for Andhra Pradesh Paper Mills' Rajahmundry facility.
- In Canada, Irving Pulp & Paper ordered a complete lime kiln system. This is the first LMD lime kiln system to be installed in Canada.

Research and Development

The Chemical Systems Division successfully launched new technology for lime mud dewatering – the LMD-Filter™. The filter is a compact design based upon disc filter technology, which reduces emissions from the lime kiln, and is a completely closed system so there is no dusting. A large LMD-Filter™ was installed at UPM-Kymmene's Pietarsaari mill in Finland and has been operating with excellent results.

The trend today is toward large "single line" mills, since redundant or repetitive smaller systems increase capital and operating costs. The Division has led this development and has active programs to produce larger scale equipment. New, higher capacity X-Filter™ systems, CD-Filter™ sizes, slakers, and lime kilns are now commercially available. An example from the Pietarsaari installation is the single, large LMD-Filter™ (to support 10,000 m³/d white liquor production) which does the work of two large drum filters.

A new lime kiln burner is being developed to meet the demanding environmental requirements of modern mills. New equipment for dregs handling (green liquor dregs) is in the final phase of developmental testing before introduction to the market.

**LMD-Filter™**

This LMD-Filter™, with Continuous Precoat Renewal (CPR), was delivered to UPM-Kymmene's Wisaforest mill in Finland. The LMD-Filter™ is the latest technology for lime mud dewatering. It achieves optimum dry solids and excellent washing results. This ensures efficient lime kiln operation with low heat consumption and low emissions.

PROFILE

→ The Recovery Division is a global leader in the supply of systems, processes, and equipment used in chemical recovery processes in pulp mills. The products of the Division include chemical recovery boilers, evaporation plants, effluent evaporators, NCG systems, and TMP heat recovery systems.

The Recovery Division's major activities are located in Kotka and Varkaus, Finland, with significant operations in Brazil, Sweden, and the USA.

Business development

The Recovery Division saw a very favorable business development in 2004. Much of the business activity was in South America, but market improvement in North America and Russia is also promising.

The evaporation plant for Arauco's Valdivia mill in Chile was successfully started up in March.

There is significant customer interest in the Andritz High Energy Recovery Boiler (HERB), which has been a focus of the Division's R&D program for several years. The technology has proven itself in commercial-scale installations – most notably the recovery boiler at UPM-Kymmene's Pietarsaari mill in Finland. The boiler started up in April, exactly on schedule. It is rated at 4,450 tons of dry solids per day, and has the capacity to fire 600 MW per day of biofuel with virtually no fossil carbon dioxide emissions. The next step towards Advanced HERB is implemented in the new SCA/Östrand recovery boiler with higher steam values to increase the power output.

In addition to the Pietarsaari project, the Division also started up the recovery island for Zellstoff Stendal GmbH of Germany in July. This recovery island is capable of meeting the tightest environ-

DIVISION MANAGER



Harry Rickman
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mental regulations using up-to-date technologies developed by Andritz.

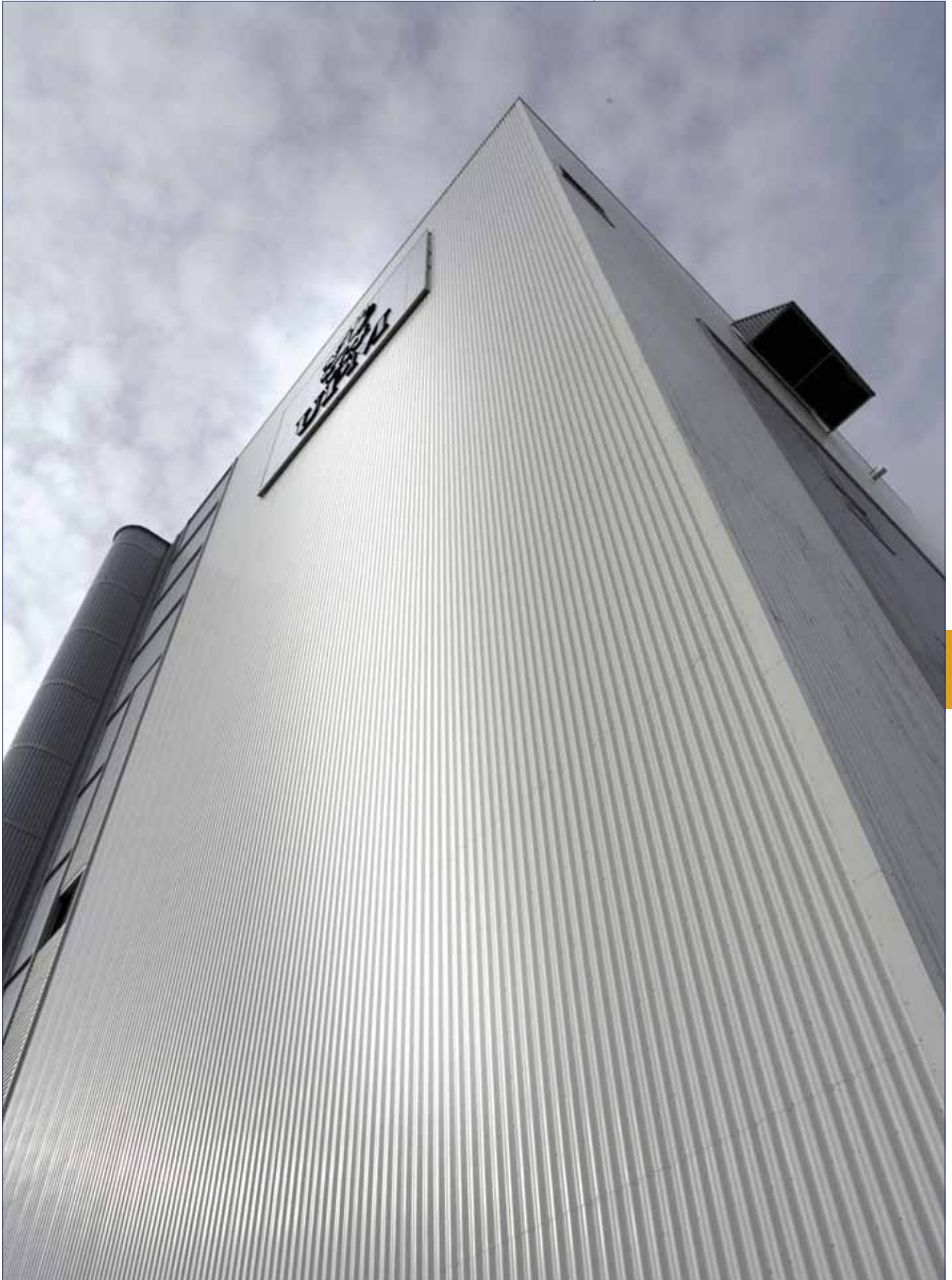
In August, the Division started up a rebuilt evaporation plant and new chemical recovery boiler for Neusiedler's Ruzomberok mill in Slovakia. A new evaporation plant for Mondi Paper's Richards Bay mill in the Republic of South Africa was started up in September.

The evaporation plant and recovery boiler rebuilds at Portucel Tejo in Portugal were started up in October.

The recovery boiler at Portucel Soporcel successfully started up in December. This project included the first chlorine and potassium removal system delivered by Andritz.

Major orders

- The Division received an order for a new recovery boiler at Portucel's Cacia mill in Portugal. The capacity of the boiler is 1,300 tds/d and it will replace two older, smaller boilers.
- A new 3,800 tds/d recovery boiler featuring a Vertical Air™ system is included in the major EPC pulp mill order from CMPC Santa Fe in Chile.
- Andhra Pradesh Paper Mills (APPM) ordered a recovery boiler and evaporation plant from the joint venture Enmas-Andritz in India.
- SCA ordered a new 3,300 tds/d recovery boiler and an evaporation plant retrofit for their Östrand mill in Sweden. The boiler will utilize state-of-the-art HERB technology with high pressure and temperature.
- A new recovery boiler for Weyerhaeuser's Valliant, Oklahoma mill in the USA will incorporate HERB technology.

**Recovery boiler**

Andritz recovery boiler at UPM-Kymmene's Wisaforest mill in Finland. It is a High Energy Recovery Boiler (HERB) designed for 103 bar/505°C and provides high energy output at minimal emissions.

- Metsä-Botnia's Kaskinen mill in Finland selected Andritz to retrofit an existing recovery boiler.
- JSC Kotlas Pulp & Paper of Russia ordered a new six-effect evaporation plant. This is the first new evaporation plant to be installed in Russia in over a decade.
- Weyerhaeuser ordered a recovery boiler upgrade for their Springfield, Oregon mill in the USA.
- JSC Neusiedler Syktyvkar ordered a recovery boiler retrofit for their Syktyvkar mill in Russia.
- Frantschach Swiecie in Poland ordered an upgrade to its existing Andritz evaporation plant to increase the dry solids content of the black liquor to 80%.
- VCP in Brazil selected Andritz to perform the modernization work for its evaporation plant and recovery boiler at the Luiz Antonio mill.

Research & Development

Chloride removal is becoming more important as mills close their chemical circulation loops to reduce emissions to the environment. A new, low cost alternative for Ash Recrystallization (ARC) using a leaching process is being developed. The leaching process removes chlorine from the fly ash of the recovery boiler. Pilot tests at the Wisaforest mill in Finland are demonstrating the success of this process for removing chlorides from the chemical circulation in the pulp mill.

Another increasing need is the ability to split the steam condensates from the evaporation process into separate streams in order to facilitate their proper reuse or treatment. A development study has been conducted by the Division to improve the calculation model for condensate segregation and to predict the quality of secondary condensate in order to meet performance guarantees.

The new giant evaporation plant at UPM-Kymmene's Wisaforest mill in Pietarsaari is the first one in the world having a steam condensate optimization to four fractions using integrated condensate segregation allowing most effective re-utilization of the condensates in mill processes.

Intensive material research has been continued to select safe and cost-effective construction materials for evaporators. Research has especially concentrated on selecting materials for evaporators operating at high concentrations and temperatures.

Development of software to model the heat transfer and fluid streams of the recovery furnace (CFD Modeling) is continuing in order to predict furnace behavior and performance. The accuracy of CFD Modeling has been compared with field measurements and the pre-processing time has been cut in half.

The Division has done considerable development work to minimize emissions from recovery boilers (particularly NO_x emissions) and to improve the reliability and safety of the boiler. The chemical recovery boiler at UPM-Kymmene's Pietarsaari mill included several innovations. The Andritz Vertical Air System™ for the first time includes a two-level spraying arrangement of black liquor. This will further decrease NO_x emissions in the flue gas. Also, a virtual dynamic simulator was included in the recovery boiler plant delivery. The simulation is so realistic that operators cannot tell the difference between a simulated operation and the actual process.

DIVISION MANAGER



Risto Hämäläinen
Savonlinna, Finland

PROFILE

→ The Pulp Mill Services Division encompasses the service activities for the Wood Processing, Fiberline, Chemical Systems, and Recovery Divisions. Primary emphasis is on the production efficiency of woodyards and kraft pulp mills, and the availability of process equipment, whether supplied by Andritz or other equipment manufacturers.

Today, there is more emphasis on Overall Production Efficiency (OPE®) of a mill's machinery throughout its lifetime. The Division provides services for continuous improvement and optimization of mill operations, as well as field services, rebuilds and upgrades of equipment, and replacement parts or engineered wear products.

The Division is headquartered in Savonlinna, Finland. It is managed through Regional Centers and operates through service centers worldwide in all important pulp producing countries. Production facilities for rebuilds are located in Austria, Finland, and the USA. The Division also partners with external workshops in other locations around the globe.

Business development

The Division's business has developed satisfactorily. There was continued strong demand for services in North America, especially for HQ Plus™ knife systems for woodyard chippers (recently introduced to the North American market), recovery boiler services, and woodyard services.

Andritz services were enhanced by acquiring the smelt pumping service business from Kaakon Teollisuuspalvelu Oy of Finland. Andritz previously was a licensee of the company's technology for North and South America.

Acutest Oy, which was acquired in 2003, was merged into the Division as a specific product group, supporting the OPE® service business. The acoustic emissions condition monitoring technology from Acutest will be utilized to support the Life Cycle Management concept offered by Andritz for different processes.

Major orders

- Significant orders for recovery boiler rebuilds and upgrades were received from customers in diverse geographies. For example, the CRISOBA mill in Mexico ordered a Vertical Air™ System upgrade, Georgia-Pacific ordered upgrades for two mills in the USA, and Visy Pulp & Paper selected the Division to perform an air system upgrade for their boiler in Tumut, Australia.
- The Division signed agreements with Metsä-Botnia's Joutseno mill in Finland for maintenance services and development. Based upon their positive experience with Andritz OPE® in one process area (white liquor plant), Metsä-Botnia expanded Andritz's role to include the entire fiberline.
- Several HQ Plus™ chipper knife systems were started up in wood processing operations. UPM-Kymmene's Wisaforest mill in Finland asked the Division to expand its service to both of the mill's chipper lines. In the wood processing area, several significant debarking drum rebuild orders were also received.

- A large boiler monitoring system based on Acutest® technology was awarded to Andritz for VCP's Luiz Antonio in Brazil. This is the second Acutest® installation in South America, showing global acceptance of this technology.
- The Division was selected to supply a displacement washing upgrade for the digester system at the MeadWestvaco mill in Wickliffe, Kentucky, USA. This delivery will include the first set of new diagonal digester screens sold in North America.
- Andritz's burner technology for lime kilns was selected by APP of Indonesia. New burners will be supplied for five lime kilns in the company's Perawang and Jambi mills.

Research and Development

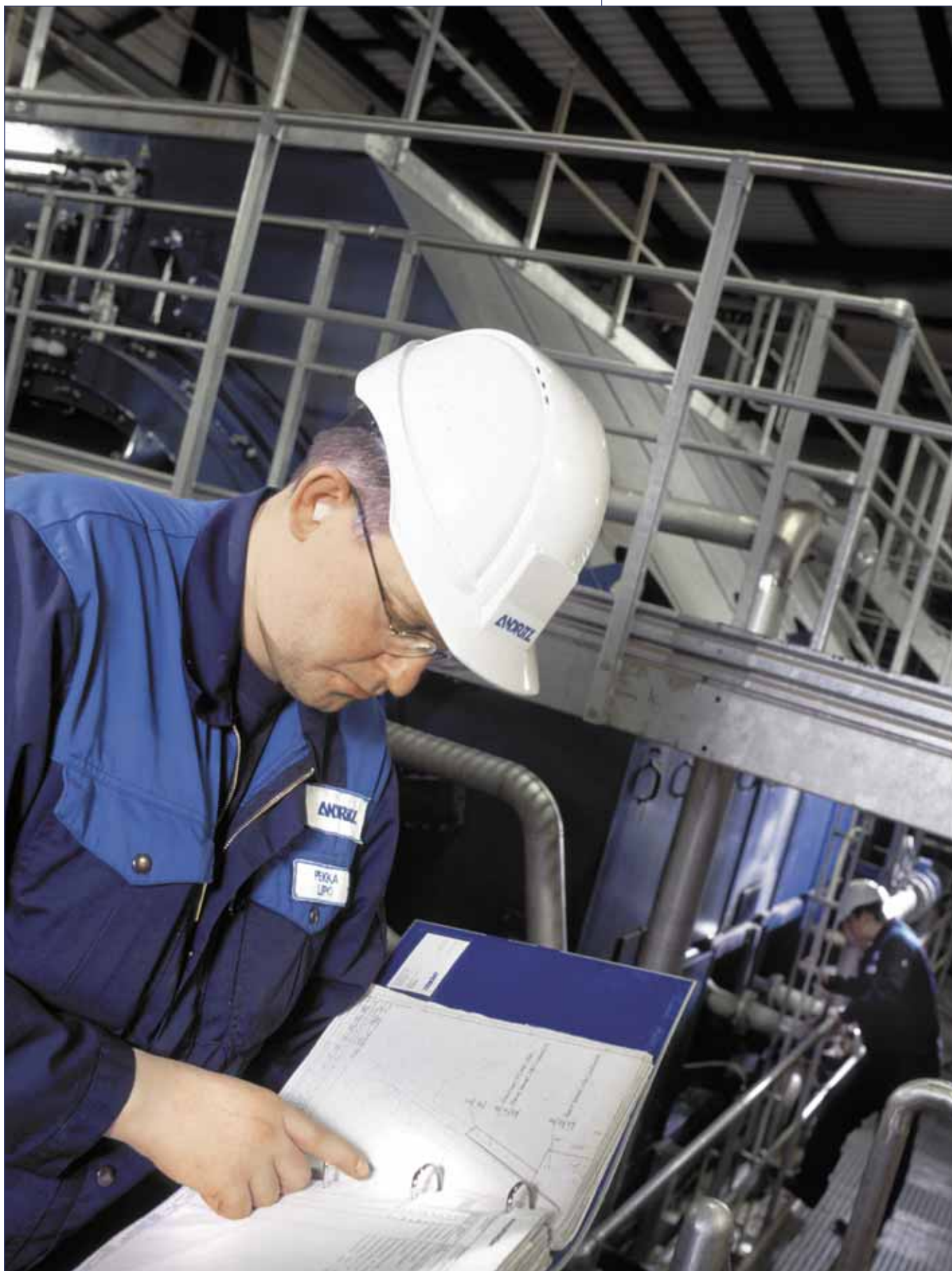
Development work in diagnostics and condition monitoring continues, with the primary focus on applications for specific Andritz process equipment. The goal of the development program is to combine data from the condition monitoring equipment with certain data collected from the processes, to optimize efficiency from both a maintenance and operations view.

New applications for Acutest® technology are being researched and developed. A program to optimize the performance and adjustment of DD Washer seal elements is one of the most recent examples. This optimizes washer performance while simultaneously reducing start-up time and life cycle costs.

To support and supplement the OPE® concept, new development agreements with customers were introduced. These agreements increase cooperation between customers and Andritz to improve both the production process and the machinery. This cooperation utilizes Andritz's complete knowledge and experience – from all relevant Andritz Divisions.

The development and testing of two new style (step-in and tapered) digester screen plates continues. The step-in design simplifies the addition of new screen rows to existing digesters or the reinstallation of screens that had been previously removed. The tapered design may allow for an increase in the circulation or extraction flow for a given amount of open screen area. Both of these designs have been sold and installed on Andritz continuous cooking systems. The early operating data is extremely positive.

Many smaller improvements for existing equipment were developed to improve the customer's process. Examples include new wash piping systems for filter washers and the cleaning of rotating wires. An example for recovery boilers is the patented cleaning device for secondary and tertiary air ports.

**Service for improved production efficiency**

Andritz offers customers its expertise in continuously optimizing the performance of process equipment to maintain or improve overall production efficiency of mills. Here, an Andritz service engineer works on optimizing a DD Washer at Stora Enso's Kotka mill in Finland.

DIVISION MANAGER



Wolfgang Lashofer
Vienna, Austria
(since January 1, 2005)

PROFILE

→ The Mechanical Pulping Systems Division is a leading global supplier of complete systems for producing high-quality and high-brightness mechanical and chemi-mechanical pulps for paper and board production and high-quality fibers for Medium Density Fiberboard and Particleboard producers.

The high-efficiency pulping technology is based on proprietary RTS™ (Retention time, Temperature, and Speed) refining and alkaline P-RC™ APMP (Pre-conditioning-Refiner Chemical / Alkaline Peroxide Mechanical Pulping) processes. Equipment for washing and high-consistency bleaching makes the Division a comprehensive supplier of systems solutions for mechanical pulping.

The Division operates through its headquarters in Vienna and Graz, Austria, as well as locations in Canada and the USA. The Division's research laboratory and pilot plant in the USA is a completely equipped and independently certified process research facility.

Business development

In a move to better support customer needs with focused solutions, the Mechanical Pulping Systems Division has recently been reorganized. Pulp dewatering and drying systems had grown to the extent that it became a separate Division, enabling Mechanical Pulping Systems to increase its focus on its core technologies.

The Division successfully completed the HC bleach plants for MD Paper in Plattling, Germany, StoraEnso in Veitsiluoto, Finland, and Holmen Paper in Wargön, Sweden. Another twin wire press was also installed at Holmen Paper's mill in Hallstavik, Sweden.

Twin wire press washing systems were successfully commissioned for Lenzing, Austria, and Jiangmen Paper in China.

P-RC™ APMP systems were started up successfully for Shandong Tralin Paper, Shandong Chenming, Yueyang Paper of China, and Tembec's Malette mill in Canada.

The RTS™ system, bleaching line, and heat recovery system for CMPC Papeles in Chile was started up successfully. Another RTS™ system was completed for Solikamsk in Russia.

A total of 17 MDF refining systems were successfully started up in China for several different customers. In addition, two MDF start-ups in Turkey and the start-up of an MDF production line in Russia were completed in 2004.

Major orders

- The Division will supply, in cooperation with the Wood Processing and Pulp Drying Systems Divisions, a complete hardwood chemi-mechanical market pulp mill – including wood-yard, chip handling, impregnation, refining, bleaching, dewatering, drying, and pulp baling systems – to be built in Kunda, Estonia. The mill will use proven Andritz P-RC™ APMP technology to produce a variety of market pulp grades from aspen wood. Andritz will supply all the major production systems.
- The Division will supply the complete chip impregnation system, bleaching, and washing systems as part of the multi-Division order from M-real for a greenfield Bleached Chemi-Thermo Mechanical Pulp (BCTMP) mill to be built in Kaskinen, Finland.

**Refiner**

The high-speed refiner depicted is part of the new RTS™-TMP line supplied to Cartulinas CMPC S.A. in Maule, Chile. It is a key element of the pulping system which produces fiber for paperboard from local pine wood resources. In addition to the new mechanical pulping line, the Andritz delivery included a high-consistency bleach plant, a heat recovery system, and an existing machinery upgrade program.

- Four new P-RC™ APMP plants were sold to Chinese producers – Jiaozuo Paper, Ningxia Meili, Zhongmao, and Xinya Paper.
- Norske Skog in Golbey, France ordered a conversion of its existing TMP refining system to advanced RTS™ technology. Norske Skog also ordered a complete new RTS™ line for their Walsum, Germany mill.
- A contract for two RTS™-TMP pulping lines was awarded by Kondopoga of Russia.
- UPM Caledonian of Scotland ordered a conversion of its bleach plant to state-of-the-art high-consistency peroxide (PHC) bleaching. M-real of Finland ordered bleaching equipment for its reject refining line in Joutseno.
- Refining systems were sold to Bowater Newsprint of Calhoun, Tennessee and Weyerhaeuser of Springfield, Oregon in the USA; Norske Skog in Pisa, Brazil; Tann Papper Dunyavaros in Hungary; Holmen Paper's Braviken, Sweden mill; and Quingsha Paper of China.
- Upgrade orders were received for a TMP reject system at Norske Skog in Albury, Australia; a chip washing system at Södra Cell's Folla mill in Sweden; and MSD Impressafiners for sawdust moisture control at Georgia-Pacific's Wauna, Washington mill in the USA.
- As a result of its reputation and rapidly growing base of MDF installations, the Division received eleven additional orders from Chinese MDF producers, one from Austria, and three large upgrade orders from customers in Luxembourg, Poland, and Germany.

Research and Development

The Mechanical Pulping Systems Division focuses its development activities on the broader use of mechanical pulps in paper and board production, minimizing operating costs in the mill, and reducing environmental impact.

As production increases worldwide, a shortage of conventional wood resources (spruce, aspen) can be foreseen in certain regions for the near future. The Division has developed technologies and equipment to process alternative raw materials such as different species of pine and a variety of hardwoods (eucalyptus, acacia, birch, and maple). The goal is to maintain the Division's technical leadership in advanced processes such

as P-RC™ APMP and RTS™-TMP refining, RT pretreatment, and PHC bleaching.

In chemi-mechanical pulping, the R&D program is concentrated on mill-scale optimization of the advanced P-RC™ APMP process, which had been successfully started up in two mills in China and one in Canada. All 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 first time, the use of alternative wood species (pine) in the RTS™-TMP process. Pulps of very high quality have been produced with these processes, and specific energy consumption has been reduced 20–30% compared to standard TMP.

Major drivers in equipment development are productivity improvements and increased production capacities. The mechanical availability and ease of maintenance for refiners and dewatering machines have been improved. An ongoing program to standardize equipment and manufacturing processes has resulted in improved quality of the machinery, reduced delivery times, and lower investment costs.

Due to the development of new screen baskets, the production capacity and dryness achieved by screw presses have been significantly increased.

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.

The acquisition of a majority stake in CyberMetrics, a supplier of online sensors for fiber quality monitoring, will further enhance the Division's ability to offer advanced measurement and control strategies for mechanical pulping in the future.

PROFILE

→ The Pulp Drying Systems Division is the leading global supplier of complete sheet drying lines comprising screening, dewatering, drying, sheet cutting, and bale finishing systems. These systems are offered separately or as a completely integrated line for the production of market pulp. Capacities over 3,500 t/d with working widths up to 9.3 m in a single line are available.

The Division also supplies wet lap systems, flash dryers, and bale forming (slab press) equipment, as well as finishing lines. As part of its services, the Division also modernizes pulp drying lines to increase production, quality, and useful life.

The Division is headquartered in Graz, Austria and has locations in Canada and Sweden.

Business development

In order to better focus on customers needs, Pulp Drying Systems was newly organized as a Division within Paper Mill Technologies in 2004. The Division works in close cooperation with the other Divisions to meet customers' requirements for drying and finishing pulp (mechanical, recycled, or chemical pulp) and uses synergies in sheet forming, dewatering, pressing, and drying with the Tissue Machines Division.

The world's largest high-speed cutter for a single-line pulp machine (9.3 m sheet width) was successfully started up at the Jiang Lin Pulp Mill in China. New systems for automated tail threading to the cutter/layboy were successfully started up at a mill of Mondi Paper in the Republic of South Africa and the Jiang Lin mill in China.

Major orders

- The Pulp Drying Systems Division will contribute the Single-Line Drying Package (including Fläkt Dryer) to the multi-Division order from CMPC Celulosa S.A. in Chile. When completed, the plant will be among the largest in the world, rated at up to 2,560 t/d production and a working width of 9.23 m.

DIVISION MANAGER



Karl Hornhofer
Graz, Austria
(since January 1, 2005)

- The Division will supply the complete drying line for M-real's new BCTMP mill to be built in Finland. This technology is the most efficient flash drying system available today.
- An upgrade to the world's largest pulp drying line at a pulp mill in Hainan, China was ordered by the mill to increase production from 3,000 to 3,250 t/d.
- The Division will provide the flash drying and baling line for the greenfield chemi-mechanical market pulp mill of Estonian Cell to be built in Kunda, Estonia.
- A fiberboard plant drying system (Twin Wire technology) was sold to Pavatex AG in Switzerland.

Research and Development

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 a production of 4,000 t/d (1,000,000 t/y) based upon the successful Twin Wire Former technology. In addition, development is underway to continually improve the machinery's uptime through easy/fast sheet threading and process condition monitoring.

A highly sophisticated process simulator based on Andritz's process simulation technology from IDEAS for the entire sheet drying line has been developed. This is used for operator training and DCS check-out prior to start-up. This simulation approach is proven to deliver fast production ramp-ups after the line is started. The simulator also contributes to continuous optimization of the plant.

Work is progressing on improving the Andritz slab press, which is an advanced development based on the successful Nilsen design acquired in 2004. The first commercial installation of this press will be at the Estonian Cell greenfield mill being built in Kunda, Estonia.



Pulp drying plant

This pulp drying plant was delivered to Jiang Lin pulp mill, Hainan Island, China. It is the largest single-line pulp drying plant worldwide, with a working width of 9.3 m and a capacity of 3,250 t/d.

DIVISION MANAGERS



Jarmo Häkkinen
Kotka, Finland



Christian Pedratscher
Graz, Austria

PROFILE

→ The Fiber Preparation Systems Division is a global supplier of systems, processes, and equipment for the provision of fiber for all papermaking processes such as recycled fiber processing, fiber stock preparation, paper machine approach systems, broke handling, sludge and reject handling, and internal water loop handling in the paper mill.

The Division has its headquarters in Graz, Austria and Kotka, Finland with significant operations in China and the USA.

Business development

Business of the Division developed very favorably in 2004. The most active markets for the Division's products were in Central Europe and China.

The majority of the systems and equipment ordered by customers in 2003 were started up successfully in 2004. This includes the stock preparation system for Jian Hui Paper Co. in China and the 400 t/d deinking line at Vipap Videm Krško in Slovenia. FS-Karton of Germany has also taken a new 200 t/d deinking line into daily operation. The line provides furnish for the top layer of a multi-ply board grade. A complete new OCC line at Cartiera del Polesine in Italy was successfully started.

Also of note are two Chinese start-ups: a complete new deinking line for newsprint production at Nanping Paper; and a complete stock preparation system for Yanzhou Tian Yuan Paper (Sun Paper),

which includes newly developed FibreSolve™ pulpers and Papillon™ LC refiners.

The rebuild of a deinking line for P.T. Aspex of Indonesia was completed. The project included the start-up of a new SelectaFlot™ flotation deinking system.

Major orders

- Holmen Paper Peninsular of Spain, UPM-Kymmene of Finland, and Shandong Huatai of China ordered key equipment for their new newsprint machines, including the market leading FibreFlow® Drum pulper and Andritz dewatering presses for pulp and sludge.
- Perlen Papier, Switzerland, awarded the Division an order for a major upgrade of an existing DIP line, including SelectaFlot™ flotation and ModuScreen™ screening systems.
- The strong market position of the FibreFlow® Drum was underscored by additional orders from the USA at SP Newsprint and American Fiber Resources. In addition, the Division received orders for FibreFlow® Drums to be delivered to Korea and Finland.
- Also in the USA, World Waste Technologies will install a unique and patented system to recover aluminum, plastics, and cellulose fiber from municipal solid waste. World Waste Technologies selected the Division to provide the major components for their recycled fiber-line at the facility.
- In cooperation with the Tissue Machines

Division, the Fiber Preparation Systems Division was successful in winning orders for complete stock preparation and approach systems or major upgrades at Thüringer Hygiene Papier and Procter & Gamble, Germany; Shandong Hengan Paper, China; and ICT Iberica, Spain.

- Also, Holmen Paper Peninsular, Spain; Al Sindian Paper, Egypt; Shandong Huatai, China; and Norske Skog Albury, Australia awarded orders for paper machine approach systems to the Division.

Research and Development

The success of a recycled fiberline or stock preparation system is based on the right integration of sub-processes such as pulping, screening, cleaning, flotation, dispersion, bleaching, and refining. It is important to have a pilot plant to run trials – upon customer request and for internal product development. A major investment by the Division in 2004 was the extension of the pilot plant in Graz, Austria so that it can run full-line trials. The Division is now able to offer full-line trials for all recycled fiber and stock preparation sequences and comprehensive testing of different process steps.

In addition to the pilot plant, the Division focused its development activities on optimizing new products (e.g. SelectaFlot™ flotation, CompaDis™ dispersion, and Papillon™ LC refining).

Also, the Division was engaged in the complete

redevelopment of conventional equipment (such as LC/HC pulpers to reduce energy consumption and widen the operating window; and the RotoWash™ “screen” which is now equipped with electron beam drilled baskets for ash washing and fiber recovery).

After extensive research in paper machine approach systems, the new ShortFlow™ concept was introduced. ShortFlow™ reduces space requirements, lowers investment and operating costs, and increases the flexibility of a paper, board, or tissue machine.

Extensive development work is underway to design a complete water handling system from the paper machine back to the pulper.



Screening plant

This screening plant is part of the complete stock preparation line supplied by Andritz to Cartiera del Polesine in Italy. The mill produces board grades from the recycling of old corrugated containers.

PROFILE

→ The Tissue Machines Division provides modern tissue machines including CrescentFormers with conventional press configurations, Through-Air Drying (TAD) technology, and machines with the patented TissueFlex™*) shoe press. Ventilation and drying systems for tissue and other paper and board grades complement the product portfolio.

The Tissue Machines Division is headquartered in Graz, Austria with locations in Canada, Sweden, and the USA.

*) Trademark of Voith

DIVISION MANAGER



Rudolf Greimel
Graz, Austria

Business development

Gold Hong Ye, Suzhou, China set a new speed record for CrescentFormers with an Andritz tissue machine. In January 2004, the machine ran at 2,100 m/min for five consecutive days producing 13.2 gsm facial tissue. A second Andritz machine at the mill also achieved a speed record of 2,060 m/min producing 17.5 gsm toilet paper. The addition of the patented Andritz PrimePickup™ device in the former section of both machines improved runability considerably.

The current world speed record is also held by an Andritz CrescentFormer tissue machine, at PT. Lontar Papyrus, Jambi, Indonesia. In December 2004, a 32-hour high-speed run was performed at a continuous speed of 2,110 m/min (product: 13.5 gsm facial tissue). Andritz tissue machines now come first, second, and fourth in the international speed rankings for CrescentFormers.

Andritz started up its first 200" wide PrimeTAD™ through-air drying production system with an annual capacity of 80,000 tons, in January 2005. Production is already ahead of the projected ramp up curve. The TAD technology applied is a new Andritz development.

Just 17 months after contract signing, a new wet-crepe tissue machine started up at SCA's greenfield tissue mill in the USA (Barton, Alabama). The machine has a total capacity of 110,000 t/y giving the highest specific production worldwide.

Andritz was selected by Procter & Gamble to modernize a tissue machine at the Neuss, Germany mill. The aim of the retrofit, which was started up in June 2004 after only ten days of rebuild activity, was to increase machine speed and improve paper quality. The Andritz scope of supply comprised a new approach flow system, a new headbox, a "speed-up package" in the wet section, web stabilizing equipment, and an Andritz dust removal system in the dry end.

An EquiDry F high-temperature hood supplied by Andritz to German Papierfabrik Gebr. Grünwald's Kirchhundem mill is responsible for a production increase of more than 25%. After one year of operation with the new Andritz hood, the machine has become one of the highest capacity machines in Europe producing machine-glazed paper.

A new PrimeLine™ CrescentFormer tissue machine equipped with a TissueFlex™ shoe press for Thüringer Hygiene Paper GmbH of Germany saw first paper on the reel in December 2004. The machine is installed at a greenfield site and will produce 30,000 t/y of high-quality toilet and towel paper.

**Tissue machine**

This wet-crepe tissue machine was delivered to SCA Tissue North America in Barton, AL, USA. With an annual capacity of 110,000 tons, the Barton machine has the highest specific tissue production worldwide.

The Andritz Fiber Drying group in Växjö, Sweden is positioned to capitalize on hall ventilation projects for mechanical pulping and pulp drying lines around the world. This is another result of Andritz's position as a full-line supplier of systems and processes for the pulp and paper industry.

The Division provides engineered services, such as machine surveys and machine optimization recommendations. An example of optimization services are the PrimeDry™ TCS (Temperature Coating Surface) measurements on the Yankee cylinder of a European tissue manufacturer's TAD machine. Recommendations based upon these measurements helped the mill improve the Yankee crowning curve considerably, which had a positive impact on the runability of the TAD machine.

Major orders

- The Division received an order to supply another CrescentFormer tissue machine, including stock preparation equipment, to Hengan, a leading manufacturer of high-quality tissue products in China. The new machine will be the third consecutive installation of an Andritz tissue line for Hengan. It will be erected at a greenfield site in Shandong Province. The new machine will produce 60,000 t/y of high-quality and very soft tissue paper.
- The ICT Group of Italy has placed an order for the supply of a new CrescentFormer tissue machine and stock preparation system. The machine will be installed in Pozuelo de Alarcon, Spain. This is the second greenfield project outside of Italy for ICT. The first project, in Poland, also included an Andritz machine.
- In the market for drying equipment outside of tissue production, Andritz Fiber Drying in Sweden received orders for a paper machine hood and air systems from Holmen Paper Papelera Peninsular in Spain (newsprint production), and from Voith for Adolf Jass in Germany (board production).

- Andritz Fiber Drying in Canada will deliver a wet end mist removal system, Yankee hood with process air system, and tissue machine dust removal system to CMPC's Talagante mill in Chile. From Familia Sancela in Colombia, the unit received an order of similar scope.

Research and Development

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 TAD plant. Operators can virtually run the future paper production line and change settings in a safe, virtual environment.

The patented TissueFlex™ shoe press has been proven in eleven installations around the world. One of its latest features is Machine Direction (MD) shoe movement for the highest operational flexibility. This additional functionality of the shoe press results in gaining more bulk, or achieving higher post-press dryness, giving the operator more flexibility.

A further development of the reel with linear primary and secondary arms is the centerwind assist drive in the secondary arm. A centerwind reel is mainly used in TAD machines to retain the bulk of 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 run in the area between the creping doctor and reel is critical to runability. The Tissue Machines Division developed a system of sheet run components, such as air or dust deflectors, suction headers, active headers with low sheet contact, and guiding/stabilizing foils. The new PrimeRun™ system ensures better runability, especially with lightweight tissue at high machine speeds.

DIVISION MANAGER



Humbert Köfler
Vienna, Austria
(since January 1, 2005)

PROFILE

→ The Paper Mill Services Division encompasses the service activities for the Mechanical Pulping Systems, Fiber Preparation Systems, and Pulp Drying Systems Divisions. Primary emphasis is on establishing service partnerships with customers to increase the overall production efficiency and availability of process equipment.

The Division offers solutions to increase the reliability, efficiency, and availability of equipment while also providing innovative upgrades, engineered wear products (Durametal® refiner plates and Andritz Fiedler screen baskets), automation products, and modernization programs.

The headquarters for the Paper Mill Services Division is Vienna, Austria. The Division is managed in major geographic regions, each with at least one service center equipped to provide responsive service to local customers. Durametal® refiner plates are manufactured in Muncy, Pennsylvania, USA, while the manufacturing of Andritz Fiedler screen baskets is performed in Regensburg, Germany (center of competence) and Brantford, Ontario, Canada.

Business development

The Division developed favorably in 2004, with customer projects mainly concentrating on modernizing and reducing production costs in paper mills.

Customer requirements to measure process parameters and product quality were the driving force behind Andritz's purchase of controlling interest in CyberMetrics, a research and development company in the USA specializing in online measurement sensors and other instruments. This will considerably strengthen Andritz's advanced refiner process control systems.

EMS, the new joint venture of Andritz and Rheinhold & Mahla, offers long-term maintenance and service contracts based upon key performance indicators that are considered most important to each customer facility. Depending on the scope of the service contract, significant economic savings can be obtained for the customer. EMS will assume responsibility for maintenance management for a production area within a mill, or a complete mill.

Major orders

- Innovations introduced to the market, not only for Andritz equipment but also for competitors' equipment, enabled the Division to secure several orders for rebuilding competitors' refiners. The Division completed six Twin Refiner modernization contracts in Central and Northern Europe, and further rebuilds of mechanical pulping lines in North America to increase productivity and reliability of the machines.
- UPM-Kymmene's mill in Steyrermühl, Austria entrusted the Division with a modernization contract for a FibreFlow® drum, an upgrade of the bleaching plant to improve the process conditions, and a shaft exchange to extend the life of a Hedemora filter.

- Several high performance screen baskets and screen rotors were started up in various screening lines worldwide. Nine Dragon Paper in China selected Andritz Fiedler as the main supplier of engineered wear products for their screening lines and expanded the service contract for Bar-Tec™ wedgewire screen baskets. The packaging paper producer APP Ningbo in China, and the American printing and writing paper producer MeadWestvaco Corp. in Wickliffe, Kentucky, awarded the Division with modernization orders to improve screening performance.
- The high performance and very low energy consumption of LemaxX Spiral™ refiner plate technology for low-consistency refiners convinced several customers, such as Neusiedler SCP a.s. Ruzomberok in Slovakia and Frantschach Swiecie S.A. in Poland, to sign annual contracts for refiner plate deliveries.
- Aylesford Newsprint Ltd. in the UK ordered a complete service and modernization for their Kvaerner washer drums. International Paper in Pine Bluff, Arkansas, USA ordered a modernization of their Bauer screw press to improve performance and reliability.

Research and Development

Intensive efforts to combine the technology of the Andritz FiberSentry™ and the former Heinrich Fiedler Strong-Bar® screen baskets has led to the creation of a new wedgewire basket. The product, known as the Bar-Tec™ wedgewire basket, will be introduced to customers in the First Quarter of 2005.

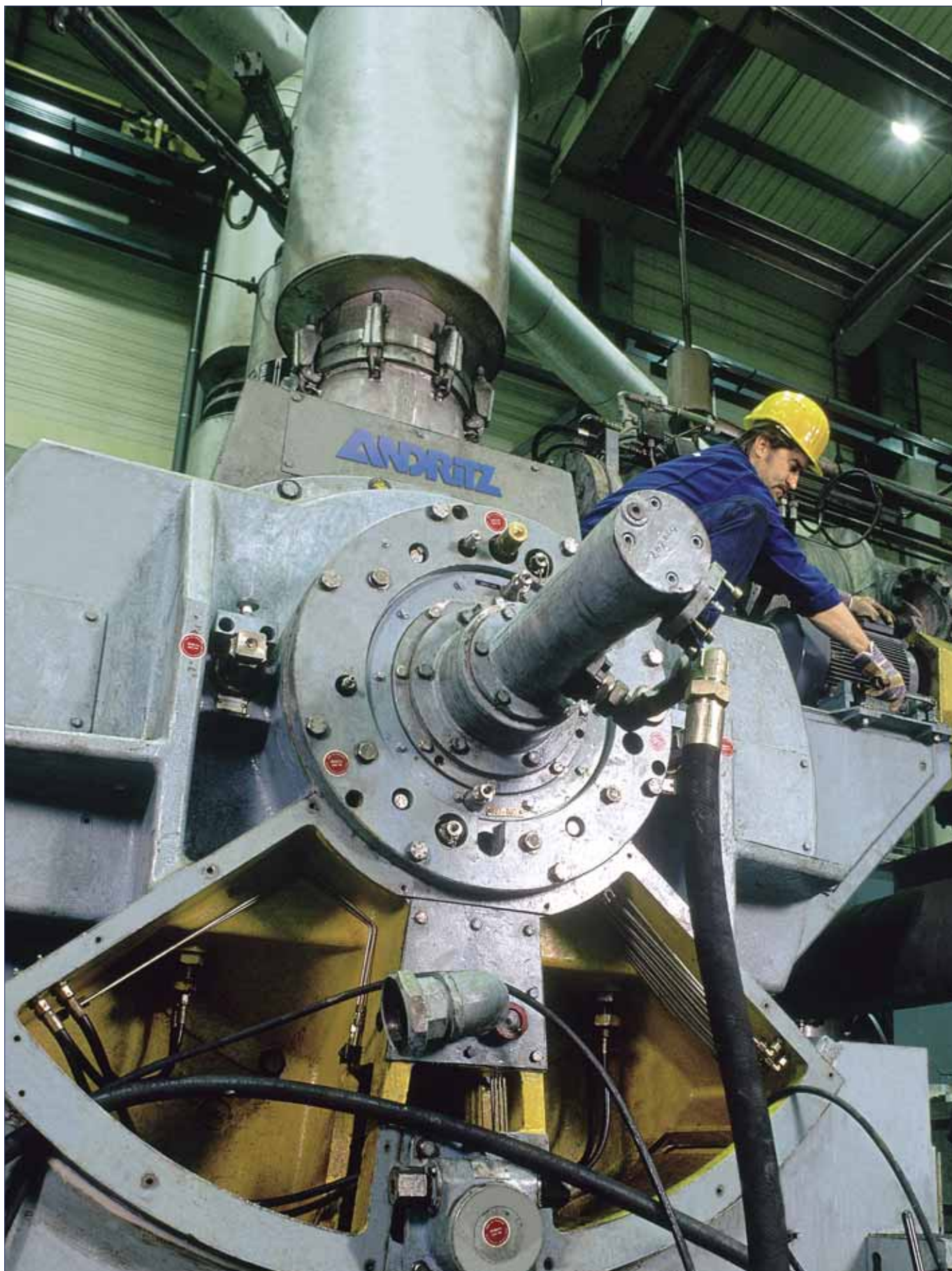
Another development in the field of engineered wear products is conical refiner plates. The first mill trial of the design was very successful. In this specific case, plate life is excellent (3,350 operating hours), as is pulp quality.

Development programs for mechanical pulping focused on a versatile new sealing system, comprehensive modular machine diagnostics to enhance condition-based service strategies, and upgrades to allow production increases of TMP at lower specific energy.

Several new techniques for equipment optimization were investigated: pulper upgrades for virgin fiber and broke; and cleaner plant rebuilds (TC 133 vortex control) for both Andritz and other manufacturers' equipment.

One example of an innovation to reduce maintenance costs is the SCP shaft machining device. This enables customers to repair and rebuild a screw press shaft without dismounting the shaft from the press – saving time and the cost of having a replacement shaft in inventory.

Together with Acutest, the Division developed a new condition monitoring system for the slowly rotating bearings in a twin wire press. The sensors continuously monitor the lubrication condition of the bearings. Defects are detected at a very early stage to avoid unplanned shutdowns.



Service for a large refiner

In 2004, Andritz once again serviced the large refiner installed at NSI Golbey, France. With Andritz's preventive maintenance program, the system maintains state-of-the-art technology with consistent improvements. It has been operating at highest availability since 1990.