

# The Analyzer

## Hi-tech Kajaani Contradicts Far North Location

### Technology Development Plus People's Outlook Makes Near- Arctic Community Part of the Global Village.

To a North American like me, Kajaani seems so near yet so far. On the map of Europe it seems like a short jump from Frankfurt or Amsterdam to Helsinki and then an even shorter hop on a commuter flight to Kajaani. Europe is small according to us North Americans. Right? In reality, it takes 6 hours of extra flying and connecting time to reach Kajaani after flying 7 hours to Frankfurt from my home in Toronto, Canada.

I have endured this muscle cramping confinement and mind numbing boredom to learn about some of Kajaani's home-grown high technology products at 64 degrees north latitude. I checked my atlas to discover that Kajaani is the same distance north as Nome, Alaska. But my urban North American thinking about northerly places is changed by what I see in Kajaani during the next two days.

On the way from the airport I pass a huge paper mill complex, which is obviously one of the economic engines of the town. I see meticulously maintained,

snow sheathed forests that are clearly a prized resource for that mill. The forest resources at this extreme latitude are made possible by the benevolent after-effects of the Atlantic gulf stream current that keeps all the Nordic Countries warmer than other areas of similar latitude.

That night I read in the Kajanus restaurant menu that Kajaani, the capital of the Kainuu region, was founded in 1651 by Count Per Brahe, a Swedish nobleman and the governor-general of Finland. The nearby ruins of Kajaani castle are a reminder of those times. Well before that – sometime over



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2000 years ago - one of the first iron works in Finland was founded in the Kajaani area (Äkäälänniemi). Kajaani is also the birthplace Finland's national epic poem, Kalevala, which created the basis for the national identity.

Looking Outside the Boundaries Centuries ago, economy was based on exporting tar from the local deposits to shipbuilders in Europe. Then came the forest industry – the sawmill, the sulphite pulp mill and eventually the paper mill. Today, however, many of Kajaani's 36,000 inhabitants are employed in high technology industries.

After a satisfying Finnish breakfast buffet made elegant by a tray of smoked salmon, I travel past architect-designed homes to the Technology Park. I am about to learn about the latest developments in pulp and paper process analysis and process controls. My hosts at Metso Automation explain to me that those market-leading Kajaani-products sold to pulp and paper companies around the world have their roots in over 30 years of technology development in Kajaani and Northern Finland.

### A Mutual Understanding

It seems to me that there is a widespread understanding of the technological needs of the pulp and paper industry, considered a core industry in Finland. This mutual understanding and cooperative effort is shared by pulp and paper producers and many suppliers like Metso Automation. The education system also sustains this effort by providing training in technology and world business skills and by fostering research and development of applied technology.

The history of Kajaani Electronics Oy (from 1970-), now an integral part of Metso Automation, captures this cooperative model in a nutshell. In the late 1960's, Kajaani Oy, the predecessor of the current UPM-Kymmene pa-



per mill, was looking for profitable extensions to the company's core business. Oulu University, about 180 km away, was focusing on electronic development and telecommunications. Most importantly many of the new electronic developments were aimed at providing benefits for the pulp and paper industry.

Kajaani Electronics started by developing applications for electronics; e.g. the ancestors of current pulp bleaching analyzers and controls were amongst the first ones. The core products of today's Metso Automation have remained focused on analyzing and controlling pulp and paper processes. The Kajaani name is well known in pulp and paper mills around the world. Today, this cooperative attitude between the suppliers and users is going strong; new developments are first tried and perfected with the support of Finnish paper mills.

### What keeps well educated, innovative people prospering in Kajaani?

From what I've learned about local people, the challenge of developing new technology tools and making them successful worldwide is a large part of it. They have received excellent local education in technology and business skills. That education

also gives them a world outlook. And new communications technologies, many developed in Finland, have made Kajaani residents a virtual part of McLuhan's global village.

Like many northern people, Kajaani people love the hunting, fishing, hiking, skiing and wild mushroom picking. I also understand many Finns' love of motorcycles, rally and Formula 1 racing. The psyche of the Finns from Kainuu also leads them to invent some rather off-beat sports activities such as wife-carrying competitions and swamp soccer. What I don't understand is their penchant for swimming in open water in middle of winter - not on a whim but as part of a regular club activity. I did jump through hole in the ice once, but I will take a pass on that activity the next time I visit Kajaani...

(SHORTENED FROM A STORY BY MARK WILLIAMSON, FREELANCE WRITER).



## The Analyzer

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### Our Analyzer Sales Force in Latin America

The head of Analyzer business in Latin America is Mr. **Marcelo Motti**, his team includes the following persons:

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**Jorge Martinez**  
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**Luis Campos**  
Country Manager

# Quality

## Comes First at Kymi Paper

**When Kymi Paper Oy, part of the UPM-Kymmene Group, started the Artti project, they set themselves a sky-high target. Only the world's best quality coated fine paper would satisfy them. And, indeed the outcome fulfilled all expectations. The new UPM Finesse 720 and 520 grades feature essentially a higher degree of whiteness, brightness, smoothness, gloss and stiffness than in any previous corresponding paper grade. Through its extensive automation and information management solutions, Metso Automation contributed to the success of the new Artti line.**

TEXT: MARJAANA LEHTINEN  
PICTURES: METSO PAPER AND KYMI PAPER



*kajaaniKSF – exceeding expectations.*

When a mill has as high quality targets as Kymi Paper has, one of the most important acquisitions is a totally dependable quality control system. For the Artti line, the choice was the PaperIQ quality management solution by Metso Automation. It forms the basis for the reliable operation of PM 8, the coater and the calender. On PM 8, PaperIQ replaced an older generation system by another supplier.

The first impressions of quality control at Kymi Paper have been most positive. "While it does take months to fine tune all controls to the optimum level", says Risto Jokinen, automation engineer at Kymi Paper. "The sensors and scanners with basic measurements such as weight, moisture and ash are working great." Quality management is increasingly moving towards the wet end, to an earlier stage of the papermaking process. On PM 8, there are now IQWetEndMD controls that provide a stable furnish to the forming section by integrating the traditional dry end feedback controls with wet end process controls. Short-term variations in grammage and other sheet properties are controlled right at the source.

These controls use measurements from five kajaaniRMi retention analyzers, two kajaaniCATi analyzers, seven kajaaniMCAi consistency transmitters, and a kajaaniKSF freeness analyzer. The latter unit automates the TAPPI freeness test for better repeatability and frequency than can be achieved manually. The

automatic cleaning cycle uses an ultrasonic cleaner and can be supplemented by automatically dosed chemicals. "We are piloting with the kajaaniKSF analyzer. We actually expected to have problems with keeping it clean, but that has not been the case. We need to service it only about once in two months, which is quite unbelievable!" Mr. Ore comments. The analyzer start-up exceeded all expectations. As Mr. Ore puts it: "Metso Automation's experts from Kajaani truly handled the start-up and tuning in the best possible way!"

*(Extracted from Automation Magazine 3/2002 available from [www.metsoautomation.com](http://www.metsoautomation.com).)*

### RECENT NOTABLE ORDERS kajaaniKSF

- Neusiedler Szolnok Papirgyar Rt., Szolnok, Hungary
- Arctic Paper Kostrzyn S.A., Kostrzyn, Poland
- UPM-Kymmene Miramichi Inc., Miramichi, Canada
- Hongwon Paper Mfg. Co., Ltd., Kyunggi, Republic of Korea



*More than proud of the rebuilt PM 8 and its new Finesse grade: Matti Ore, Risto Jokinen, Stefan Fors and Markku Rantanen of Kymi Paper.*

## Twofold Increase in kajaaniBRITEi Measurement Frequency

A new performance upgrade in kajaaniBRITEi™ now delivers a twofold increase in measurement frequency, with no effect on accuracy. Doubling the number of measurements provides even faster control and improved measurement reliability.

Compensated Kappa factor control, long used in D0- and D1-stages combines the benefits of



relative and continuous in-line measurements to absolute on-line measurements. With Compensated Kappa factor control we can move D0-stage Kappa factor to the theoretical optimum. EOP-Kappa is stable and we are able apply optimum ClO2 dosage in D1-stage. With this concept every pound of lignin gets same treatment.

In O2-stage we cannot utilize the continuous response from an in-line brightness sensor as relative Kappa indicator because of the high black liquor content. But the need for a fast response also in O2-stage exists.

### Benefits gained

Now, with this improved measurement frequency and faster response to process changes, Kappa factor can be stabilized

closer to the theoretical optimum point in the O2-stage. This leads to

- better pulp quality,
- higher pulp viscosity,
- stable post-O2-Kappa number with less chemicals and
- low carryover to bleaching.

In addition to this, the well-established Kajaani pressurized power wash combined with the chemical analyzer wash ensures a non drifting measurement.

### What makes this system faster?

- Bottlenecks in mechanics during sample washing and consistency sweep have been removed.
- Transportation of new sample takes place while the previous sample is being analyzed.
- The consistency of the new

sample is estimated from the dilution factors of the previous sample. For the majority of samples this gives a correct initial consistency without additional adjustment.

- Optimization of sample and analyzer washing sequences.

### RECENT NOTABLE ORDERS

#### kajaaniKAPPAi/BRITEi

- UPM-Kymmene Oyj, Wisaforest, Finland
- Cia SUZANO de Papel e Celulose, Suzano, Brazil
- Smurfit-Stone Container Corp., La Tuque, Quebec, Canada
- Simpson Tacoma Kraft Co., Tacoma, WA, USA
- Blue Ridge Paper Products Inc., Canton, NC, USA
- Nippon Paper Industries Co., Iwakuni, Japan
- Daishowa Paper Hfg. Co. Ltd., Suzukawa, Japan
- Smurfit Carton de Colombia S.A., Colombia

## Market Pulp Quality

In chemical pulping management, the two most important end product quality factors are the amount of dirt and the brightness. Metso Automation's new pulpexpertDCD continuously analyzes dirt and brightness from automatically sampled sheets on the baling line just before weighing and packing. Results are used to qualify pulp to the right quality class according to customer specifications.

When the drying machine is started up after shutdown, there is typically a lot of dirt. After running a while, there is a decrease in the amount of dirt found in the pulp sheets. A great opportunity for optimization is to know exactly when the pulp quality has

changed sufficiently to comply with specifications. Any change of dirt amount can be easily detected with pulpexpertDCD taking a new sample every 10 minutes. Detected low quality pulp can be taken back to the pulp mill before it has been stored.



## FiberLab – Using the Sample Feeder

Now the Fiberlab analyzer can be provided with a pneumatically operated Sample Feeder. This unit is installed to the Sample Unit, and it enables feeding up to 6 samples to the Sample Unit in succession. The feeder wheel is not directly compatible with the older Sample Unit: some mechanical changes (e.g. to sample vessel detectors) are required. Sample Units with Sample Feeder are assembled at Metso's factory in Kajaani.



In addition, analyzer's user interface software must be upgraded. This upgrade can be installed to the analyzer on-site.

# kajaaniALKALi Improves Process Control and Reduces Operating Costs at North American Pulp Mills

Metso Automation has received repeat kajaaniALKALi analyzer business for automatic measurement and closed loop control of the causticizing process from two different pulp and paper companies, one with a coated board mill in the southeast United States and the other with a linerboard mill in southern Alabama. Both of these analyzers will be used to improve process efficiency and reduce operating costs by automating slaker and green liquor TTA control, plus measuring white liquor strength to the digesters for improved alkali to wood ratio control. In addition, kajaaniALKALi ana-

lyzers are installed at the following North American mills to reduce operating costs through automated process measurement and enhanced closed loop control of the causticizing, cooking and recovery processes:

- Bowater, Coosa Pines, AL (2 units)
- Domtar, Cornwall, ONT
- Domtar, Windsor, QC
- Georgia Pacific, New Augusta, MS
- International Paper, Bastrop, LA
- International Paper, Georgetown, SC
- International Paper, Natchez, MS
- International Paper, Prattville, AL
- International Paper, Riegelwood, NC
- Kruger Wayagamack, Trois Rivieres, QC
- MeadWestvaco, Rumford, ME
- Papiers Fraser, Thurso, QC

- Smurfit-Stone Container Corp., La Tuque, QC
- Weyerhaeuser, Columbus, MS

Metso Automation also has a kajaaniALKALi analyzer for digester liquor measurement and control on the Kvaerner ITC digester at Weyerhaeuser in New Bern, NC. In addition, a kajaaniALKALi analyzer is in use on the single vessel Kamyrdigester at International Paper in Courtland, AL. Both of these kajaaniALKALi analyzers are measuring white liquor strength for improved alkali to wood ratio control and digester black liquor residual alkali for improved residual alkali profile control. For more information,

please contact Mr. Paul Manahan, Product Manager for kajaaniALKALi Analyzers in North America, paul.manahan@metso.com.

## RECENT NOTABLE ORDERS

### kajaaniALKALi

- Andritz Oy, for Zellstoff Stendahl GmbH, Germany, for causticizing
- Weyerhaeuser Co., Pine Hill, AL, USA, for causticizing
- Nippon Paper Industries Co. Ltd, Japan, for causticizing
- Cia SUZANO de Papel e Celulose, Suzano, Brazil
- International Paper Company, Jay, ME, USA

## Implementation and Assessment of Advanced Controls at Daishowa Marubeni International (DMI) D0 Stage Controls

**GUY M. NORMANDEAU**, DAISHOWA-MARUBENI INTERNATIONAL LTD, PEACE RIVER, ALBERTA AND

**ALISON C. ROWAT**, METSO AUTOMATION INC., NORCROSS, GEORGIA

The Daishowa Marubeni International (DMI) mill in Peace River, Alberta has undergone several evolutions in bleach plant control strategies. Their control implementations consisted of three steps, listed in chronological order:

- 1) Kappa Factor Control
- 2) Compensated Brightness Control
- 3) Compensated Kappa Factor Control

Although Kappa Factor Control applied ClO<sub>2</sub> required for the lignin entering the D0 stage, liquor carryover variability from the brownstock washing system forced operators to add chemical bias in a non-systematic way.

The mill upgraded their brightness and residual sensors to the new i-series sensors and they

tracked the changes in carryover very well: Compensated Brightness with these well-tuned sensors reduced chemical usage on the D0 stage significantly over feed-forward Kappa Factor Control. Finally, combining the two worlds: feed-forward Kappa Factor Control with quick feedback from the Brightness and Residual sensors provided the best results. These results are summarized in the following table:

	Kappa Factor Control	Compensated Brightness Control	Compensated Kappa Factor Control
D0 Kappa Factor	0.269	0.187	0.126
D1 Kappa Factor	0.167	0.197	0.232
D2 Kappa Factor	0.026	0.033	0.020
Total ClO <sub>2</sub> Kappa Factor	0.463	0.417	0.378
Total ClO <sub>2</sub> Usage, %	2.13	1.61	1.44

Compensated Kappa Factor Control, using the Kajaani control algorithm, lowered ClO<sub>2</sub> usage by 9.2% and total Kappa Factor by 9.4% when compared to Compensated Brightness Control, and lowered ClO<sub>2</sub> usage by 31.3%

and total Kappa Factor by 18.4% when compared to Kappa Factor Control.

NaOH usage was lowered by 9.9% when compared to Compensated Brightness Control, and by 30.9% when compared to Kappa Factor Control. Compensated Kappa Factor Control has reduced chemical usage dramatically at the DMI mill while still remaining robust to process upsets such as large variability in

unbleached kappa number and black liquor carryover. DE Kappa Number was not measured, nor was it used for control during this comparison. However, this is the next step in further improving DMI's Bleach Plant operation.



Scot Weston from the DMI Electrical and Instrumentation department visits the installed kajaani-BRITEi and says, "We really haven't had to do anything with this unit. We've had no problems. All sample valves work really well, and it just runs itself".

To order the whole report, please contact: [pirjo.heikkinen@metso.com](mailto:pirjo.heikkinen@metso.com)

kajaaniKAPPAi has gained a position of trust of its own class. Read more in the next Analyzer and in [www.metsoautomation.com](http://www.metsoautomation.com)

# Kerinci Works to Fine Tune Automation to Reach True Potential

TEXT: MATTI POITSALO  
AND HUGH O'BRIAN

As pulp and paper mills have become more technologically sophisticated in recent years, they have gotten much more efficient at producing a ton of product with lower raw material input, such as wood, water, chemicals and energy. When all of the field devices, including the advanced controllers, analyzers, and measuring systems, are working as they should, mill production is much more tightly controlled, which reduces the swings and variations at all stages of the process. With the process running in a more steady-state mode, pulp and paper makers can then reach their target values with much greater accuracy and, as a result, the need to run with costly safety margins becomes a thing of the past.



*Kerinci is the largest pulp mill in the world, making up to two millions tons per year of bleached hardwood.*

## Expertise is the key

Assessing and fine tuning equipment in a mill can be a very large job, usually beyond the scope or capability of the mill staff. There-

fore many of the more advanced mills around the world have turned to the solution of outsourcing of their process optimization programs to external experts to both raise production

and quality, with little capital investment. Metso, a world-leading supplier to the pulp and paper industry, has been expanding its scope to be capable of supporting its customers as a partner in planning, maintaining and developing their production processes throughout their life cycles. Known as Future Care, this new concept adds value to both parties by combining Metso expertise and customer needs in a long-term partnership.

## Kerinci is a pioneer in Asia

The Riau Andalan Pulp & Paper mill at Kerinci in Sumatra has been a pioneer in Asia with respect to the concept of outsourcing the fine tuning of its sophisticated field control systems. The RAPP Kerinci mill is the world's largest pulp mill with a nominal capacity of 2 million tons per year of bleached hardwood kraft pulp. The mill also includes a state of the art fine paper machine cranking out 350,000 tons per year of uncoated fine paper, much of it sold around the world under the PaperOne brand name. RAPP has been working on a comprehensive maintenance agreement with Metso Automation for nearly four years. Kerinci has nearly 10,000 Neles and Jamesbury control-, on-off and manual valves; numerous sophisticated Kajaani kappa, brightness and wet-end analyzers; and Valmet consistency transmitters.

## Support from the top

A key figure in this effort has been A.J. Devanesan, who from the beginning of 2002 has held the position of president and COO of the April Group. Devanesan, an Chemical engineer by training, has worked on the Kerinci mill project from day

## CUSTOMER TRAINING IS A GIVE-AND-GET OPPORTUNITY FOR A SUPPLIER



*Analyzer training for RAPP mill personnel was arranged in September 2002. There were about 30 participants from various departments such as Operation, Production, Fiberline and Technical Department, as well as Chemical Plant, EID Maintenance, Recausticing Department and also from the Pec-Tech Engineering Project team. Seen here on the front row are: Nour-Eddine from IPST; KN Reddy, Superintendent Fiberline; Syafrul, Superintendent*



*of Technical Department and Mhd. Ali Shabri, Production Manager.*

*Mr. Raymond Walsh, Operation Manager asserted his main tasks for this huge mill complex for meeting targeted production figures of over 2M tonnes/year, with the two existing fiber lines. "All analyzers must be in top condition with high efficiency and fine tuned to optimize the controls for the benefits of the mill". The goals set by Mr. Walsh are in line with the*



*strategy of the Riau Andalan Pulp & Paper Corporation, which, according to Mr. Heikki Hassi, the head of technology in RAPP, is to maximize mill performance through high availability and utilization rate of "auto-mode" at all the departments (pulp mill, chemical recovery, steam and power generation, chemical plant and wood yard). The future brings new challenges as the mill is aiming at using acasia as their one and only raw material.*

one in 1992. He was highly involved in the first pulp line, working his way up from project manager to his present position today as company president.

On the subject of outsourcing, Devanesan is convinced that this approach is the way to go, both as a means to lower costs and to improve product quality. "I want to outsource whatever I can where I will get better quality for the same or better price for the work that needs to be done. This is especially true with respect to maintenance and repairs. For example, on our baling line we outsourced the maintenance to Metso in the beginning of 2002, which seems to be a much better allocation of their resources

and ours. We are also concerned about manning levels at the mill. If we can have a part time expert



watching over a specific area or type of equipment, that seems to me to be a better allocation of our resources rather than having that person on our staff full time."

*A.J. Devanesan, President and COO of the April Group, has been highly involved in the efforts to outsource process optimization functions. "If we can have a part time expert watching over a specific area or type of equipment, that seems to me to be a better allocation of our resources than having that person on our staff full time."*

So as part of a Future Care package that April and Metso Automation are putting together, Metso Automation will be responsible for servicing and optimizing the operation of the mill's control valves, process analyzers and consistency transmitters to make sure that they are running up to their full potential. This will be measured by mill variables such as hitting production and quality targets, process availability and uptime, as well as other parameters which impact the bottom line.

*(Extracted from Automation Magazine 1/2003 available from [www.metsoautomation.com](http://www.metsoautomation.com))*

## Charge Controls Improve Wet End Stability, Provide ROI at Norske Canada, Crofton

By **MARK WILLIAMSON**,  
FREELANCE WRITER, THORNHILL, ONTARIO

With automatic charge demand controls, mill sees better wet end stability and runnability plus coagulant chemical savings. These benefits add up to a six-month payback.

The term "anionic trash" is now well established in the lexicon of papermakers. Today, the variability of furnish charge demand is discussed almost as commonly as consistency and freeness. It's for a good reason. The stability of a paper machine's electrochemistry, which significantly affects retention and drainage, is a critical factor in achieving the best quality and runnability in new high speed, high shear paper forming processes. Moreover, the wet end of the machine can be upset more easily with increased water system closure and the use of recycled furnish. The development of online charge demand measurements and controls have resulted in better wet end perfor-

mance. NorskeCanada's Crofton Division on Vancouver Island is a good example of a mill where these practical online measurements and controls supplied by Metso Automation have provided much more insight into the wet end operations, much better process stability and a handsome return on investment.

Like most mills, the Crofton Division invested in retention controls first. Retention controls, using continuous, online measurement of headbox and tray water consistencies, have been well established since the late 1980's. Today, there are over 500 machines with online measurements and closed loop retention controls.

### A new dimension

Automatic, online correction of furnish charge chemistry was the next wave of technology to sweep through the wet end management field and has added a new dimension to control capa-

bility. The first online charge measurements appeared in the early 1990's. These controls have improved upon and stabilized existing retention controls. Now, with online charge demand measurements, papermakers are able to neutralize and stabilize variations in charge demand by automatically regulating coagulant chemicals, independent of flocculant controls. According to the Crofton mill's experiences, these measurements and controls can be simple to implement, effective and can produce good bottom-line benefits.

Crofton started with a comparative, 4-month trial of online charge measurement systems organized in August 2001, with one supplier on PM1 and another on PM3. Since both systems use a charge titration method and streaming current end point detection, the measurements proved to be equivalent. The kajaaniCATi supplied by Metso Automation was chosen for PM1. The simple, trouble-free

commissioning and less frequent manual cleaning were factors in the selection process.

### Six Month ROI

The mill reports that the online measurement and combined charge and white water consistency controls have produced an excellent return. The payback period was about six months, calculated as a combination of chemical savings and a reduction in wet end breaks.

*(Total article available from [www.paperloop.com](http://www.paperloop.com))*

### RECENT NOTABLE ORDERS kajaaniCATi

- Stora Enso Oyj, Oulu, PM 7, Finland
- Confidential, Germany
- M-real Stockstadt GmbH, Stockstadt/Main, Germany

# PulpExpert "Part of Paper Machine"

## at Stora-Enso Varkaus Mill

By **MARK WILLIAMSON**, FREELANCE WRITER, THORNHILL, ONTARIO, CANADA

Automated pulp analysis with Metso Automation's PulpExpert, provides pulp furnish properties precisely and frequently, resulting in better information about the short-term trends of furnish quality and better control of them. The Stora-Enso Newsprint mill in Varkaus, Finland is good example of how PulpExpert has made the papermaker's jobs easier and more effective.

"The PulpExpert is now part of the paper machine," says Markku Mäkilä, Development Manager of PM4 and the TMP operations. Pulp Expert systems are installed on PM2, PM4 and in the TMP plant at Varkaus. The first permanent installation in the Varkaus mill was made on PM2 in 1997. This unit also analyzes ground-wood pulp quality. At that time, manual freeness and consistency tests were made three times per day. When the automated measurement had proved itself, manual testing was gradually reduced until it was done only once per week as a calibration

check. "Today, no shift analysis is done anymore. Now, the lab can concentrate on research and development," says Mäkilä.

### Keeping Furnish Quality on Track

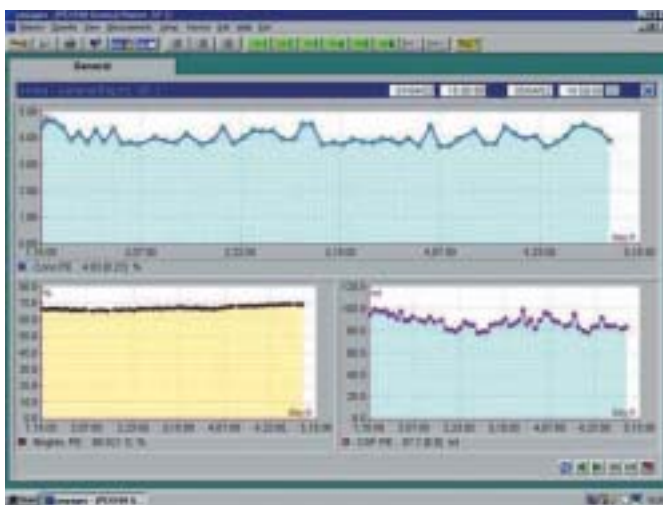
With PulpExpert, the gap between the wet lab and the paper making process has been bridged so that operator actions are based on the most current furnish quality information. And that responsiveness is very important for efficiently changing grades and keeping paper properties on track. Both PM2 and PM4 are multi-grade machines. For instance, PM4 is a large "improved newsprint" machine that makes over 50 grades with different furnish recipes, sheet finishes and colors. The furnish is comprised of TMP, stone ground-wood, deinked pulp and kraft. PulpExpert measures the consistency, freeness and brightness of each of these furnish components plus the mixed pulp.

### Consistency Standard

The consistencies measured gravimetrically by PulpExpert are considered to be the standard in



Stora-Enso's Reetta Juutilainen (left) and Markku Mäkilä in front of PulpExpert on PM4.



Graphical trends of PulpExpert tests -like the ones above -are used by operators to effectively plan and execute grade changes on PM4.

the Varkaus mill for the calculation of each pulp type in the furnish blend. Inline consistency transmitter control fast changes, but PulpExpert defines the absolute levels. The mill has also installed kajaaniRMI analyzers to measure and control white water consistencies. In addition to more stable consistencies, they have seen savings in retention aid use on PM2.

### Accurately Repeats Grade Quality

In the TMP mill, the PulpExpert system includes a module to measure fiber length and shive content. Refining is more accurate according to Mäkilä. He also says, "On the paper machine we can more accurately repeat grades." The information from

PulpExpert is displayed on a video terminal in the control room of PM4. In addition to a DCS link, information is transferred to the mill's information network. The operators on PM4 use the improved information to track furnish quality before and during grade changes.

### LATEST NOTABLE ORDERS PulpExpert

- Arjo Wiggins Ltd., Basingstoke, U.K.
- Stora Enso Kabel GmbH & Co, KG, Hagen, Germany
- Solikamskumprom OAO, Solikamsk, Russia
- Daishowa America Co. Ltd., Port Angeles, WA, USA