

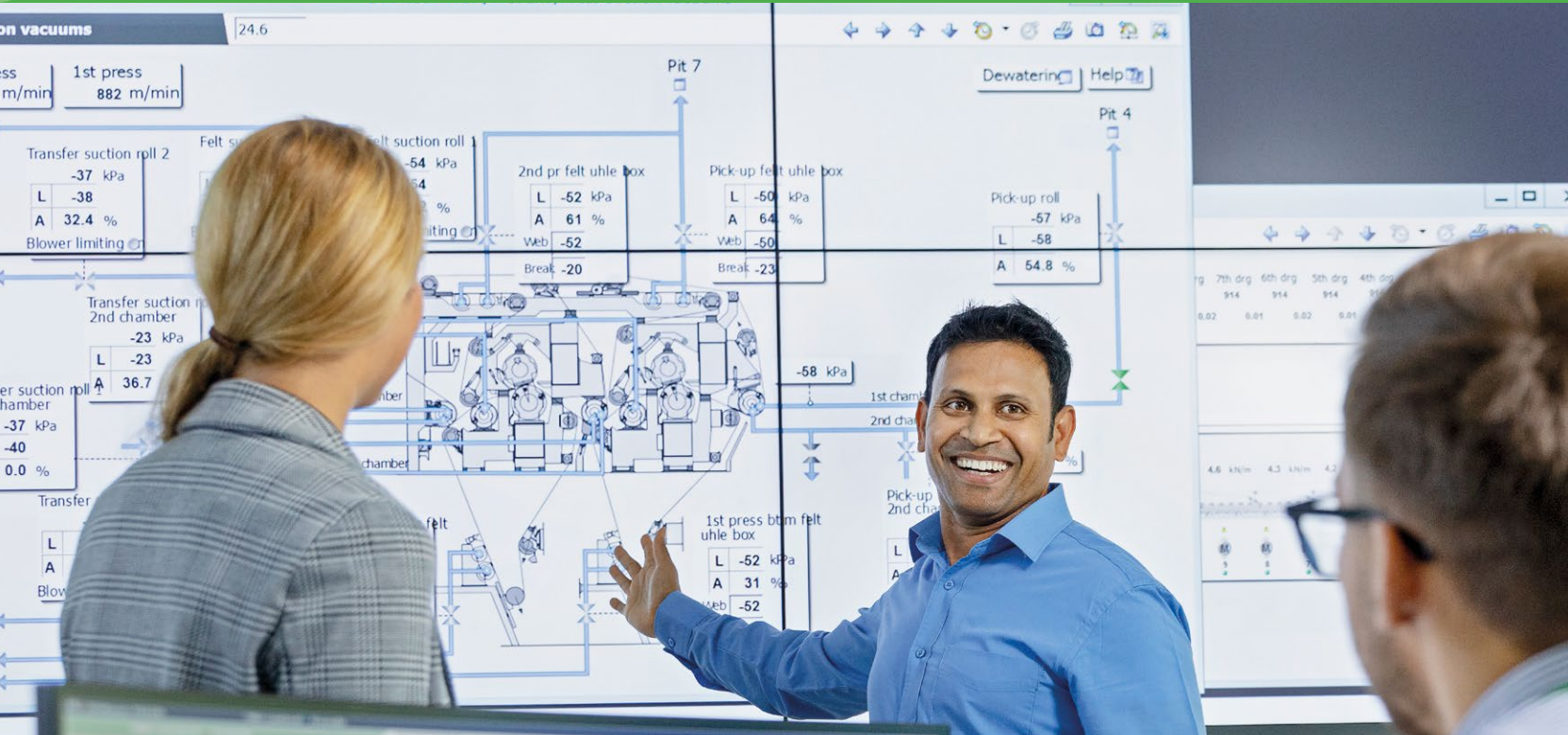
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raw materials 54

Forward

VALMET'S CUSTOMER MAGAZINE | 3/2019



Turning
data
into value

Editorial

At the forefront of digital evolution

Valmet has a long history in the digitalization of process industries. The launch of the Damatic distributed control system (DCS) in 1979 laid a solid foundation for the company's digital development, which has continued ever since.

Over the years, the system – now called Valmet DNA – has been further developed. The latest developments have been so revolutionary that today we are talking about the new nature of automation.

It was great to see the enthusiasm for our new web-based user interface for Valmet DNA automation system when it was recently introduced to customers at a technology trade fair. With the help of this new user interface, the use of the automation system can be extended beyond the traditional control room at your mill or plant. Unlike the traditional control room, the “control space” moves with you everywhere with your mobile device.

While Valmet DNA has been the backbone for embedding intelligence into the machines and processes, it has also enabled the development of the Industrial Internet solutions by providing a solid base for process data. Valmet has developed a comprehensive offering of Industrial Internet applications and services which seek to improve the visibility and profitability of a plant's or mill's operations by analyzing and utilizing data even more widely for the customer's benefit.

In this magazine, you can explore more about how we help to turn process data into value, and how we ensure the data is at your disposal – whether it's through your mobile device or through a remote connection from Valmet's Performance Center. At valmet.com you can acquaint yourself further with the new nature of automation.



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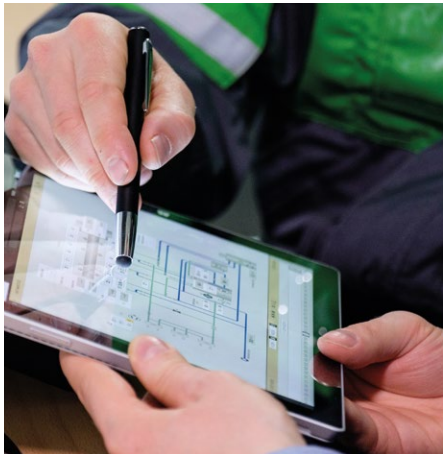
The secret of wet pressing efficiency often lies in making the right choices for the press section consumables.

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In brief



Control rooms go mobile

Valmet DNA is an automation and information platform for process control. In 2018, Valmet was the first in the market to introduce web-based DNA Dashboards that visualized a plant's key performance indicators, providing users with an opportunity to access information with mobile devices outside the traditional control room. In 2019, this renewal continued with the introduction of a new web-based Valmet DNA User Interface (DNA UI).

"Several features make our new user interface attractive. It's web-based, and no installation is required. With the help of web-based technology, you can use the interface wherever you want, whenever you want – and with whatever device you want," says **Petri Tiihonen**, Manager, Automation Product Management.

Personalized user profiles and access control, as well as personalized pages and content, enable effective work, but also give responsibility to the right people.

"All in all, DNA UI makes work more collaborative. In this renewed user interface, we've really thought about people, their tasks and responsibilities, and communication and ergonomics," says **Peter Hölzl**, Valmet's Program Director.

A new pilot facility for bioenergy, biofuels and biochemicals

Valmet is investing in a new pilot facility at its Fiber Technology Center in Sundsvall to strengthen the company's research and development capabilities related to bioenergy, biofuels and biochemicals. The new pilot facility will start up in October 2020. With the upcoming pilot facility in Sundsvall, Valmet can demonstrate state-of-the-art technology to customers and investors in the biorefinery business.

"Successful research and development work requires cooperation with customers and partners. This investment will strengthen Valmet's continuing development within the biomass conversion field and our possibilities to contribute to the fossil fuel phase-out and decreased climate impact. The new pilot facility will be an important platform for future innovations," says **Mats Arnberg**, Director, Biomass Conversion, Pulp and Energy business line, Valmet.



8

Industry- and area-specific Performance Centers make Valmet's expertise easily available to customers through remote connections and tools.

Valmet retains its position among the world's sustainability leaders

Valmet has been included in the Dow Jones Sustainability Index (DJSI) for the sixth consecutive year.



In collaboration with

“Ensuring sustainable business practices is at the core of Valmet’s way of operating. Maintaining our position in the Dow Jones Sustainability Index provides further proof that we’ve improved our sustainability performance year by year, as continuous improvement is the key criterion for inclusion. Our systematic sustainability agenda defines concrete actions for the upcoming years, and we’ve been training our employees to understand their role in achieving targets. Our success is strongly based on the excellent work of every Valmeteer around the world,” says **Pasi Laine**, President and CEO of Valmet.

In 2019, Valmet has also received other sustainability acknowledgements. In January, Valmet achieved the best A rating in CDP’s climate program ranking. In February, Valmet was awarded the Bronze Class Sustainability Award in RobecoSAM’s annual Sustainability Yearbook 2019, and in April, Valmet was reconfirmed as a constituent of the Ethibel Sustainability Index (ESI) Excellence Europe.



A new digital platform for field services

Valmet is investing in a new digital platform to support, streamline and develop its strategically important field services. Valmet Field Services’ offering consists of maintenance and process- supporting services, annual shutdowns and remote assistance. The global implementation of the new platform will be completed by the spring of 2020, and it will replace multiple current platforms.

“The new platform will further improve Valmet’s capability of providing world-class services to our customers through workforce transparency and connecting our on-site field service professionals with Valmet Performance Centers through remote connections. This makes delivery of desired services at customer sites faster and more accurate. It also allows us to better predict and advise about services, and develop shared maintenance and service roadmaps for our customers’ equipment and processes,” says **Anders Öhrblad**, Director, Field Services Growth, Valmet.

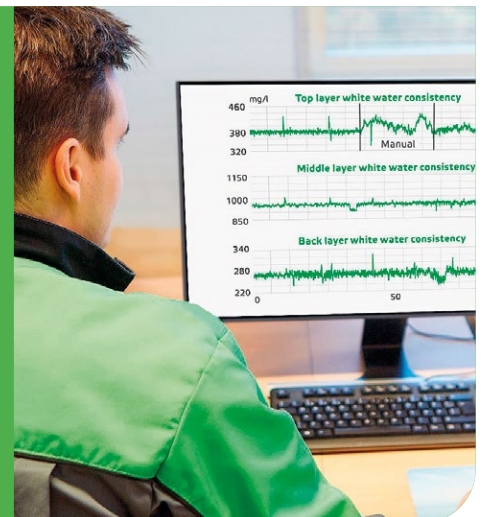
A stand-alone wet end control package

Valmet is introducing a new control product called Valmet Stand-Alone Retention Control (Valmet RET) for retention and break-time headbox ash consistency management. It offers benefits for paper, board and tissue makers previously only available to the users of Valmet DNA process control and the Valmet IQ quality control system.

Utilizing Valmet Retention Measurement (Valmet RM3), low consistency measurement and control hardware with

state-of-the-art model predictive control, the product enables users to take the control of the wet end to a new level.

“Both controls, based on the Valmet IQ MD Optimizer, already have a proven track record. We know that by stabilizing the wet end, we can offer improved quality, chemical and energy savings, as well as better runnability for virtually every grade,” says **Timo Rantala**, Product Manager, Automation, Valmet.



CUSTOMER'S VOICE

Moving forward together



The intelligent giant



A giant was born when Bohui started their new containerboard machine BM 6 – the widest and largest of its kind in Asia. From the initial start-up all the way to the conversion to printing paper production, the onsite processes and machine optimization have been supported by global experts from Valmet's Performance Center.

TEXT Sara Li and Kaisamajja Marttila PHOTOS Sara Li

With a width of 9,600 mm and a designed speed of 1,600 m/min, Bohui BM 6 can produce lightweight and high-strength corrugated liner and fluting, as well as printing papers.

Started up in March, 2019, in Huantai, Shandong Province, it is currently the widest and largest single-machine output containerboard production line in China.

Zhou Tao, Project Director of Bohui, explains that after extensive first-hand experience of Valmet's technologies and research in China and abroad, they were impressed with the overall solution. "We chose to invest in this ambitious production line with high stability, large output and low unit consumption. The economies of scale will enable us to increase our profit margin, which is the main way we can differentiate ourselves from the competition," Zhou says.

Industrial Internet:
"We can connect remotely with world-class experts at any time."



The start-ups of BM 6 were supported remotely from Valmet's Performance Center. Valmet's remote experts worked seamlessly with onsite experts. In picture: Jukka Savolainen Technology Manager, Valmet Performance Center Jyväskylä, Finland.



From corrugated board to printing paper

“The board market is now weak because of fluctuations in international trade, whereas the printing paper market has been growing gently and steadily. We recently shut down one of our printing paper production lines. To retain customers and seize the market opportunity, the company therefore decided to convert BM 6 to printing paper production,” Zhou says.

The conversion was completed within a month, and three days after the start-up, the first batch of products came to the market. The Grade A pass rate exceeded 95 percent, solid proof of a successful market entry.

Liu Yuguo, Production Director of Bohui, admits to having been doubtful about the decision to switch production. He wasn't sure the inexperienced mill team was up to the task. But looking back now, Liu is delighted with the

results, which exceeded all expectations. “I could never have imagined such a successful conversion, and the outstanding quality of the final product really surprised me,” he says.

Ramp-up supported from Valmet's Performance Center

The start-ups of BM 6 were supported remotely from Valmet's Performance Center – first, to ensure a smooth start-up of the board machine, and then to secure a successful transition to paper production. Valmet's remote experts worked seamlessly with onsite experts.

“The strength of remote support is that it ensures everything goes smoothly,” says **Heikki Tattari**, Valmet's Paper Technology Manager. “Data-based working makes the support more proactive and allows us to keep one



The starting point for the work with Bohui has been the Valmet DNA system and its connectivity with the Performance Center. In picture: Zhang Tao, Automation Manager of Bohui BM 5 and BM 6, and Si Chenglin, North Area Manager, Valmet Automation in China.

Advanced automation

"This paper machine's automation level is very high. It's an advantage to have equipment and automation in a unified platform," Liu says. He adds that the paper machine's automation accuracy and the control system's chain reaction and trigger point are the best he has ever experienced. Moreover, this largely compensates for the operating team's lack of experience and manpower, because the production line requires only nine operators, and the equipment is very user-friendly.

High technology levels

"Our steam consumption is currently in the lowest level in China. It's even 20 percent lower than we'd expected, thanks to the design of the double shoe press section. And the design of the double-layer headbox is a solid guarantee of product quality," Zhou says of the machine's technological highlights.

BM 6 uses 100 percent domestic OCC as raw material to produce corrugated board. "The bursting strength and folding resistance of the finished product are equivalent to that of similar machines which use 20 percent American OCC as raw material. That's a big advantage for us," Zhou adds.

Remote and on-site services

"The start-up and optimization of BM 6 has been supported remotely and onsite, and Valmet currently helps us use data analysis to optimize operations," Liu says. The machine also started up with Valmet's fabrics, and the mill's maintenance operations are supported by Valmet's spare parts package.

"The machine's high stability, large output and low unit consumption, combined with economies of scale, will increase the profit margin, which is the best way to differentiate from the competition," says Zhou Tao, Project Director of Bohui.



According to Liu Yuguo, Production Director of Bohui, the domestic industry's current situation is still based on analyzing paper machine problems after they have happened, with no preventive or predictive analysis. This definitely needs to change.



To support the grade conversion into paper, BM 6's stock preparation was fortified with OptiFiner refiners.

step ahead. It's also a fast way to connect the customer with the best experts to solve problems and guide them forward," he says.

More concretely, the network of Valmet's remote experts provides in-depth analysis to support onsite actions during the start-up and optimization phases. "Start-ups tend to be hectic, and there's no time for analysis. The focus is on getting paper onto the reel. Onsite fixes are usually like aspirin: they remove the pain but don't necessarily fix the problem. Remote experts focus on data and long-term benefits," Tattari explains.

Remote support – the secret weapon

"The starting point for our work with Bohui has been the Valmet DNA system and its connectivity with the Performance Center. The advanced diagnostics tools have proved valuable in supporting the conversion to paper production," says Jukka Savolainen, one of the Performance Center's experts. Both Savolainen and Tattari also



Shortly after the start-up, the output and speed of BM 6 achieved more than 90 percent of the designed capacity and speed.

give credit to the Bohui team. “The customer is always the best expert for their own process – we’re the secret weapon to help with tricky cases without delay and can provide data to back up their decisions,” Savolainen says.

Transparency is key in remote support. Bohui gets monthly reports with information about what has been optimized and how, including further recommendations and immediate fixes for acute challenges. Data security is also a top priority: All connections are based on secure remote connection, and only selected persons within Valmet have access to data.

Increased reliability and performance with Industrial Internet applications

Both Bohui’s BM 6 and BM 8 utilize Valmet’s Industrial Internet applications, such as in-depth machine condition and reliability applications, to predict and avoid production losses.

“With these tools, we can connect with world-class



experts at any time, use a world-class production line as a benchmark and rank among the best in the world. And this is only the beginning. I believe we'll gain even more benefits in the future," Liu says.

Optimization continues

The process has now stabilized, and the machine and automation work in unison, but the optimization will

continue as BM 6's product portfolio is further expanded to offset paper, writing paper, school paper, and electrostatic copying paper.

"Next, we will dig more deeply into individual machine sections to optimize them so the machine can continue to produce the planned tonnes, and we can expand the product portfolio," Savolainen says.

A common goal achieved

Zhou is satisfied after his first cooperation with Valmet and pleased with both teams' cooperation in achieving their common goal.

"Shortly after the start-up, the output and speed of BM 6 reached more than 90 percent of the designed capacity and speed. The start-up curve is excellent, and some indicators have even broken the international record. I'm very grateful to Valmet's strong team," he concludes.

"When the board market has recovered, we'll be ready to convert back at any time, thanks to this flexible universal paper machine," Zhou says. ■

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Scope of Valmet's delivery

Paper machine

- Stock preparation
- Approach flow system
- OptiFlo Layering Gap Headbox
- OptiFormer Gap former
- OptiPress Linear press
- OptiRun drying section
- OptiSizer Film and supply systems
- OptiCalender Hard calender
- OptiReel Center reel
- 2 x OptiWin two drum XL winders

Auxiliary systems

- Mechanical drives

Automation

- Valmet IQ QMS
- Valmet DNA DCS
- Conditioning monitoring and web break analysis
- Valmet PQV

Industrial Internet

- Valmet Performance Center
- On-demand expert support
- Remote monitoring & optimization
- Paper machine Diagnostics application

Services

- Fabrics & felt package
- Spare part package

→ "Our two teams worked as if they were one. We've learned a lot from Valmet's experts, and the paper machine is now running well," says He Yujin, Production Manager of BM 6, shaking hands with Zhang Haiyang, Start-up Engineer of Valmet.







"APP has partnered with Valmet on major projects in the past, and we expected and received the same good level of cooperation in all areas of the project," says David Kerr, who was the General Manager of OKI Pulp and Paper Mill during the project.

APP's OKI pulp and paper mill in Indonesia is one of the largest in the world. The mill has broken several world records since its start-up in 2016, while delivering top quality. The success of the project lies in the mix of the best pulp expertise and a true team effort.

TEXT Kerstin Eriksson and Lotta Forssell
PHOTOS MMS Dreamteam

Breaking records

at OKI Pulp and Paper Mill

The construction of APP's OKI Pulp and Paper Mill, with an annual production of 2.8 million tonnes of bleached hardwood pulp, began in South Sumatra in 2014, and the mill started up in late 2016. Valmet was chosen to deliver key technology, including pulp drying and baling, evaporation, ash treatment, biomass drying and gasification, lime kilns, green liquor handling, biomass boilers and the mill-wide NCG collection system.

Valmet has a proven track record in supplying high-quality equipment with innovative and leading-edge

technology. This explains why Valmet was chosen as a major supplier for OKI, one of the world's largest pulp mills.

"APP has partnered with Valmet on major projects in the past, and we expected and received the same good level of cooperation in all areas of the project," says **David Kerr**, who was the General Manager of OKI Pulp and Paper Mill during the project and first years of operation.

A successful multinational project

The project was a true team effort. Professionals in the pulp and papermaking business have a unique and kindred spirit – no matter where they are from. APP and Valmet recruited highly skilled specialists across the globe for the OKI project.

"Although language sometimes got in the way a little, the natural glue of talent and skill across all nationalities made the project a tremendous success. Personally, I was proud to be part of a diverse global team, made up of many different backgrounds, working together to start OKI," says Kerr.

Throughout all phases of the project, from planning to full operation, APP brought in the best talent from their existing mills, and this, coupled with new OKI employees and Valmet specialists, was a key success factor.

"There are many challenges with a greenfield project of this magnitude. Valmet and OKI worked closely together through all project phases to solve each challenge and to ensure a smooth start-up. For the mill's start-up and ramp-up, Valmet supplied skilled technicians in each area. We could always rely on them for critical support when needed. And the operation of the mill has been excellent so far," says Kerr.

Fast, efficient and highly productive pulp dryers

Valmet's solutions represent the latest and best available technologies, improving customers' sustainability performance by increasing raw material, water and energy efficiency, and reducing emissions and waste in their industrial processes.

The pulp dryers at OKI are the largest machines in the world with the highest ever production. "Valmet has good equipment with very high wet end and press section dewatering features, and the machine is wide. This allows us to be fast, efficient and highly productive. We've managed to achieve production records with the new lines from an early stage," says Kerr.

OKI mill has two pulp drying machines, each with a width of 10.6 meters. Since the start-up, several production records have been registered. As the machines are the biggest in the world, each of the records was a new world record. In June 2019, the production record for both machines combined was 8,630 air dry tonnes (ADT) in one day, and 4,360 ADT for a single machine.

"We can meet the highest quality standards and produce excellent pulp grades."



The pulp drying machines at OKI are the largest in the world. Each has a width of 10.6 meters.

“These records were accomplished thanks to a skilled and dedicated Indonesian workforce supported by a few international specialists. We also have an excellent quality pulp furnish made from fast-growing acacia plantation fiber,” Kerr adds.

Energy-efficient recovery island

Like many areas in the OKI mill, the evaporation plant is by far the largest in the world, and the dry solids are exceptionally high.

“We’ve tested the full capacity of our evaporation plant, and the results have been good. The high dry solid level provided by the evaporation plant gives us higher steam generation in the recovery boiler, high and steady furnace temperatures, with low emissions of sulfur dioxide and TRS,” Kerr comments.

The condensate treatment system is designed to enable 100 percent reuse of condensates in mill processes – for example, in fiber line and recausticizing. The recovery boiler ash is treated in an ash crystallization plant to keep potassium and chloride at the desired low levels in the mill’s recovery cycle. The ash crystallization is fully energy-integrated in the evaporation plant, optimizing the steam balances.

The lime kilns at the mill use biogas produced from acacia bark as fuel. “The bark gasifiers have allowed us to almost eliminate fossil fuel in our lime kilns. This equipment needs further optimization to reach its full potential. In essence, this will allow us to make the OKI mill 100 percent fossil fuel-free,” Kerr adds. ■

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The evaporation plant at the OKI mill has 7+ effects and very high final dry solids for extraordinary overall energy efficiency.



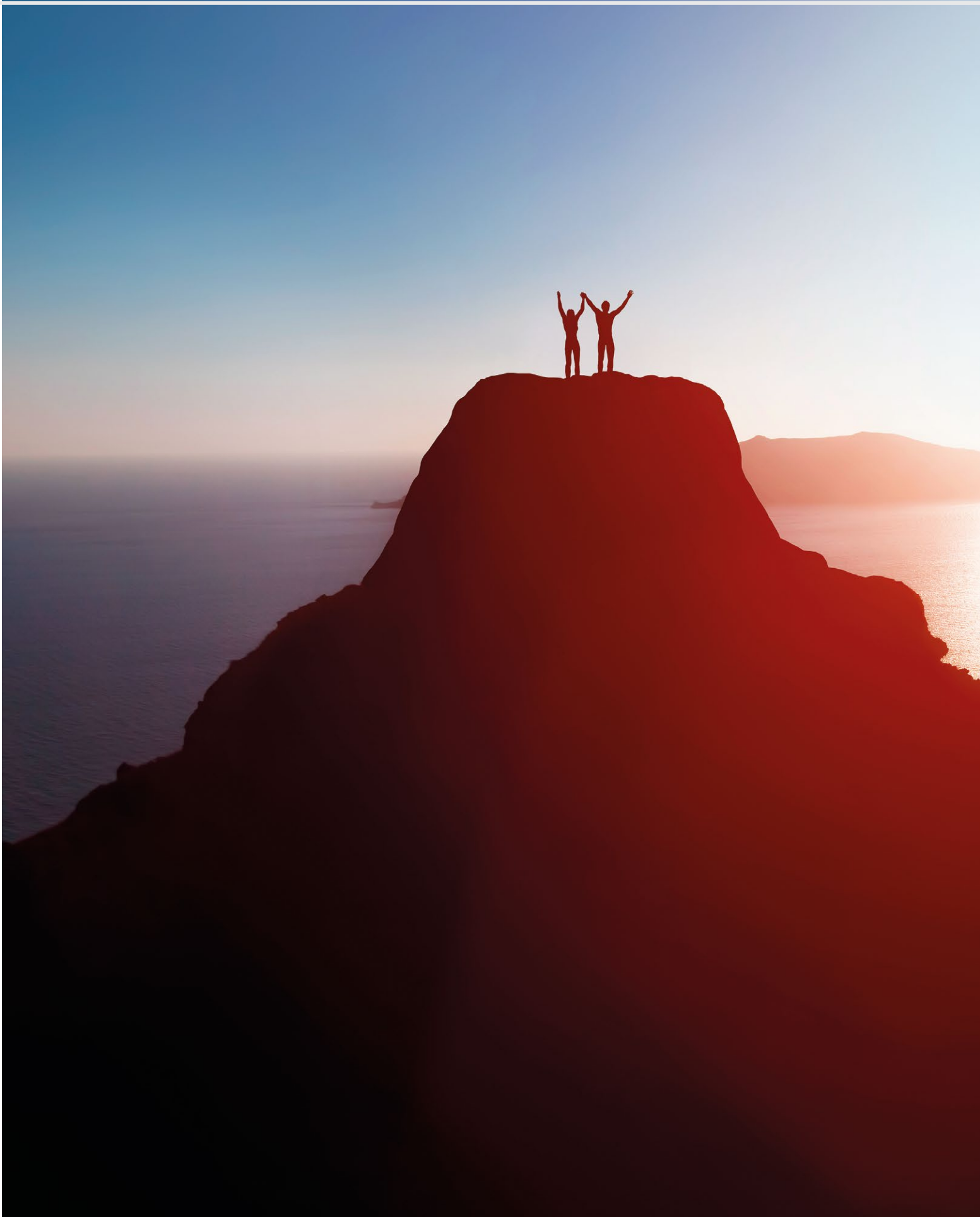
Joining expertise for a global success

Johan Schotte, who was Valmet’s project director in the OKI project, has seen numerous projects around the world during his 37-year career at Valmet.

“This project was truly global and special in many ways. Many of the islands delivered by Valmet are the biggest in the world. This meant that technology development was required for the equipment’s scale-up. We had technology from all the home bases in the Nordics – Finland, Sweden and Denmark. In addition, we had project support from South America, China and India, and quite a lot of the manufacturing was done in China. Valmet was also responsible for the site installation supervision. We had 200 professionals at the site – including both global and local professionals.

The customer truly respected Valmet’s technical knowledge and expertise in delivering this kind of project. Whenever our shared journey with the customer faced a hurdle, we were always able to find a solution.

It’s been rewarding to see this project through from start to finish. The things I’ve valued most are the people, the great team spirit and the good cooperation between the Valmet and customer teams.”



Winning with outsourcing

Uni Viridas delivers fuel and sells heat and electricity from their biomass power plant in Babina Greda, Croatia. Everything else is looked after by Valmet. This successful cooperation was continued with the operation and maintenance contract's extension in early 2019.

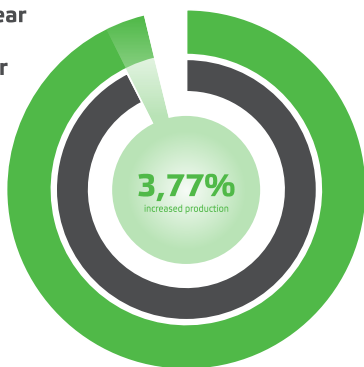
TEXT Kristofer Sjöblom

Outsourcing operation and maintenance of a mill or plant can be a win-win solution. This is the case for Babina Greda's biomass powerplant, which was engineered and built by Valmet. When it comes to scope, the agreement represents the first of its kind in Valmet's history and has proven successful for both parties.

"Outsourcing operation and maintenance are a smart step in maximizing the benefit-cost ratio, considering we're an investment group (Unit Group) with a large portfolio of power generation assets. They significantly decrease the workload for an investment company, and the plant can benefit from the good relations between Valmet and its suppliers. Also, the operation and maintenance guarantees provided by Valmet are important to us," says **Alkin Yaman**, General Manager of Uni Viridas.

Planned MWh/year
compared to
Actual MWh/year
(based on 3 year average)

■ Planned MWh/year
■ Actual MWh/year



The Babina Greda biomass power plant is a fluidized bed boiler – BioPower 8 CEX modular power plant – with a maximum electrical output of 10 MWeI, based on a maximum heat output of 16 MWth. Forest biomass wood chips are the utilized fuel.

Successful outsourcing

The Babina Greda power plant was built by Valmet in 2015. The scope of delivery included civil works, buildings, fuel handling equipment, a turbine and generator, and a water treatment system. In 2015, Valmet began to operate and maintain the plant on behalf of the customer – for the first time ever to such an extensive scope. The agreement was extended by 10 years at the beginning of 2019.

“Our journey with Valmet started well before the operation of the power plant, during the EPC implementation period. All the people we met at Valmet shared a strong company culture, proven expertise and good communication skills. Once these are in place, there’s a very strong chance of success, and this is what we’ve experienced when we’ve worked with Valmet,” says Yaman.

Top-notch technology

Suncica Lalic is a Croatian entrepreneur and a board member of Uni Viridas. She saw the building of the Babina Greda plant as a very good investment opportunity.

“The investment has turned out well. The power plant performs wonderfully because of the project’s excellent execution. It has proved to be perfectly constructed and designed. We’re very proud of Babina Greda,” says Lalic.

“The equipment and technology are top-notch! Compared to other investments in the region with different solutions, we strongly believe that our plant is among the best performing,” says Yaman.

All-in-one – operation and maintenance

Uni Viridas had several options before they decided to outsource the operation and maintenance to Valmet for 10 more years.

“Valmet built the plant, so they’re very familiar with the equipment and technology. It’s logical that they operate and maintain it. The Babina Greda power plant is extremely reliable, and we’ve experienced exceptional cooperation and flexibility from Valmet. They have great concern for the customer,” says Lalic.



The teams from Unit and Valmet at the signing ceremony in Istanbul at Unit’s head office.

“Valmet’s performance in the last 3 years makes continuing cooperation for the next 10 years logical.”

A successful shared journey

This is the first time Valmet has taken full responsibility for a plant’s everyday operation. **Markus Bolhár-Nordenkamp**, Director Energy Sales and Services at Valmet, gives his view on outsourcing:

“It’s been a journey into uncharted waters. We’ve seen complete outsourcing as an interesting possibility, which has along with this project become reality. The cooperation with Uni Viridas has been excellent, and it’s a win-win solution, because we can maximize the plant’s performance until 2029.”

CONTACT PERSON

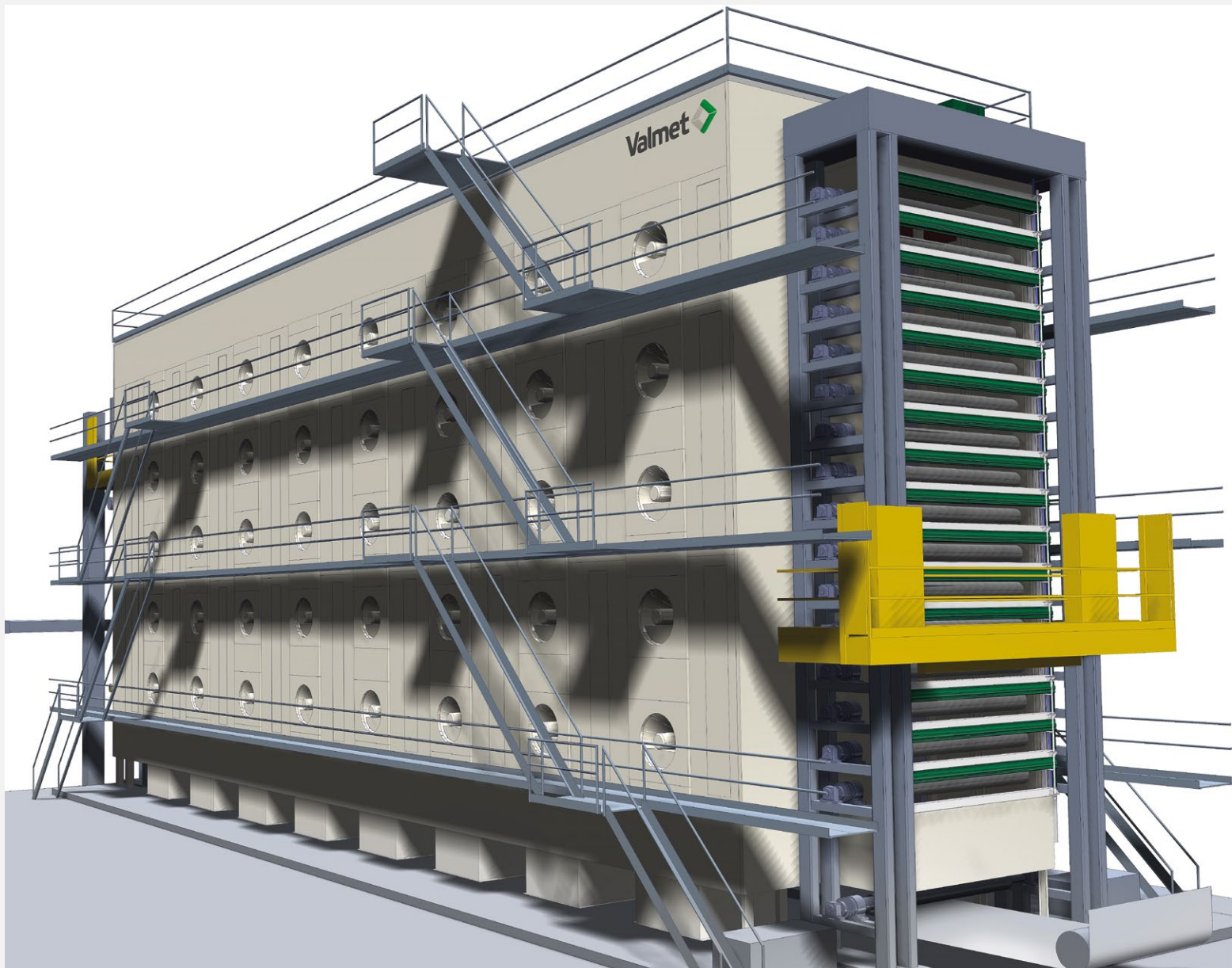
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The Babina Greda power plant’s availability has exceeded agreed targets. For example, there have been minimal unplanned outages and low flue gas emissions, and efficient low fuel boiler operations and water consumption have been demonstrated. There has been no reports of injuries which have resulted in time lost from work or reports about environmental incidents.

Scope of operation and maintenance contract:

- Day-to-day plant operation
- Guaranteed availability performance
- Scheduled preventive and predictive maintenance utilizing Computerized Maintenance Management System (CMMS)
- Unplanned corrective maintenance
- Fuel handling, ash and sand handling
- Routine testing (boiler water chemistry analysis, solid fuel quality)
- Remote performance monitoring
- Annual shutdown maintenance planning and execution, contractor management
- Spare parts management
- Production and maintenance planning and reporting
- Health, safety and environmental management
- Human resources management, certification and training, payroll, time scheduling
- Contractor and service provider management
- Regulatory inspections (PED, ATEX, Environmental)
- Hazardous chemical management
- Spare part and consumables purchasing and delivery
- Budgeting, purchasing, cost control, invoicing



New Valmet Pulp Dryer Fold-up Hatches

Changing
the game

Valmet's new pulp dryer fold-up hatches have proved a game changer for Stora Enso's Imatra Mills: The previously risky operation of pulp dryer hatches has become easier, faster and safer.

TEXT Heli Kankare PHOTOS Stora Enso

Valmet is continuously innovating new solutions to improve customer safety. In a pulp dryer, there are dozens of end hatches made from steel and/or aluminum.

"The operation of the hatches has been considered problematic at several mills, so we were thinking about whether there was a completely different way to make them," says Esko Similä, Valmet's Project Manager.

After intensive development work, new fabric end hatches were created: a lightweight easy access solution, with a new automated operation. All the hatches can be opened with a single button – and a considerably lower risk of injury.

One risk less

At Stora Enso's Imatra Mills in Finland, the KU1 pulp dryer machine's hatches were old and rusty, and approaching the end of their useful life. About the same time, an operator made a safety observation concerning the operation of the hatches. This prompted the mill to seek a better solution.

Stora Enso's Imatra Mills were willing to pilot the new Valmet hatches and ordered the first Valmet Pulp Dryer Fold-up Hatch to replace two hatches at the dry end of the dryer. Once they were convinced it was a well-functioning solution, they ordered new end hatches for the entire pulp dryer.

Reserve Supervisor Jaakko Kinnunen from Stora Enso's Imatra Mills is very happy with the performance of the new hatches: "We've got rid of heavy hand-opening hatches that caused unnecessary tearing and hence a risk of injury. The previous hatches also entailed a dropping risk and possible injury if the hinge failed." He continues: "The visibility through the dryer has also improved considerably."

Easier and safer operation

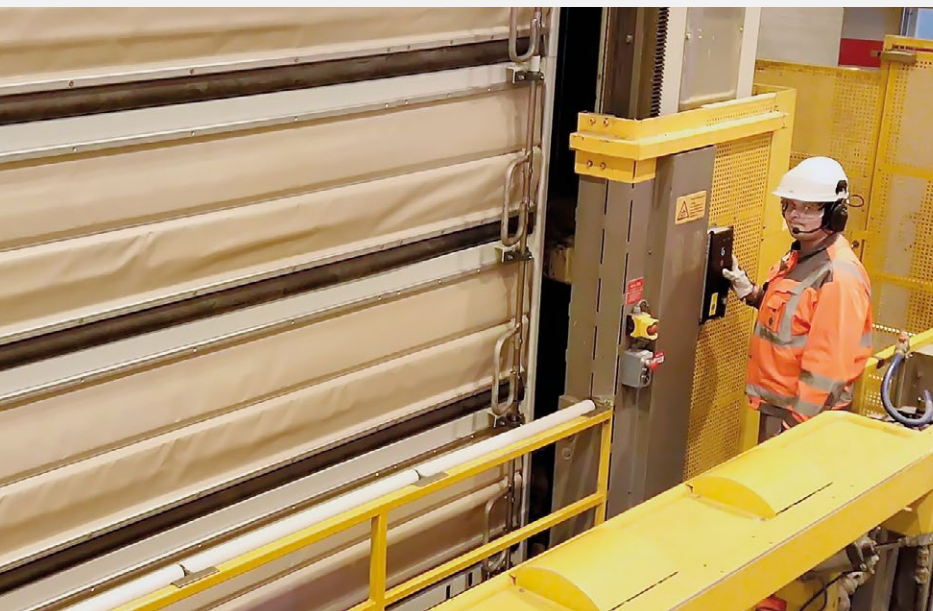
"Our operators are giving good feedback about how the hatches make dryer cleaning and checking easier, faster and safer," says Kinnunen.

Several safety and operational benefits come with the new hatches. The new solution has considerably less joint surface, so it leaks less than the old solution, keeping the hot air in the dryer. The surface temperature of fabric is much lower than with steel. The new hatches enable an open view throughout the dryer and at the same time make it possible to cool down the dryer more quickly.

"I really want to credit Stora Enso's Imatra Mills' willingness to try new and innovative solutions, and the great people working there who are enthusiastic about launching new innovations," says Similä.

"The whole project went smoothly, and we like the way Valmet reacts quickly if any problems arise," concludes Kinnunen. ■

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"The hatches make the dryer cleaning and checking easier, faster and safer."



What's in the recovered paper?

Recovered paper is a valuable raw material for Smurfit Kappa Hoya Mill, which uses recovered paper for container board production. With Valmet Bale Tester, the mill gets an objective and fair view on the raw material content and quality. **TEXT** Heli Kankare **PHOTOS** Rolf Zacher, Heli Kankare

Smurfit Kappa is the market leader for recovered paper-based packaging production. Its Hoya Mill in Germany has two production lines: a containerboard machine producing 360,000 tonnes p.a., and a board machine producing barrier board for food packaging. The containerboard machine uses 100 percent recovered paper as raw material.

“We use the new bale tester technology from Valmet to obtain information about the content of plastic, ash, kraft and humidity in the recovered paper. The information on the quality is automatically stored in our SAP system. This information is important for our production department,” says **Olaf Bietz**, Purchasing Manager of Smurfit Kappa.

The Valmet Bale Tester has a measuring device with a drill which penetrates the bale on a truck, making a hole in it and extracting the sample from the bale. The measured bale and the drill location are selected randomly. Measuring is based on Near-Infrared Sensor (NIR) technology. This is a reliable and real-time measuring system, providing information for mill operations, resulting in production cost savings and the capability of improving the recycled fiberline itself.

Organized raw material flow

Recovered Paper Yard Manager **Nils Oestmann** explains the material flow at the mill's recovered paper yard: "We have 80 trucks bringing the recovered paper five days a week, plus trains from Denmark and Norway. We test

"We know the contents of each bale when it goes to the conveyer and pulp feeding area."

each truck and train load, and do about 160 tests every day. Now that we have a better understanding of the material mix in each load, we can steer the storage and consumption process. We know the contents of each load



➔ The tested side from the truck is randomly selected.



← Global Product Manager Minna Puro (Valmet), Recovered Paper Yard Manager Niels Oestmann, Purchasing Manager Olaf Bietz and Logistics Manager Volker Wollschläger checking the functionality of the Valmet Bale Tester.

when it goes into the pulper. Production is planning to get the full benefits of this information in planning and quality optimization – for example, in the use of additives and chemicals.”

Remote support from Valmet

Valmet has a remote connection to the Bale Tester at the Hoya Mill and an agreement for remote support. “With the remote connection, we get quick support for technical problems. It’s very important for us and has benefited the whole project,” says Logistics Manager Volker Wollschläger.

A European standard for the paper and board industry

“By the end of 2019, there will be bale testers at five Smurfit Kappa mills in Europe. Our plan is that this will be the European standard for the quality control of recovered paper. For us, this isn’t just about achieving savings – we want quality control at the beginning of the process,” says Bietz.

“This bale tester has been further developed in a project with Valmet, and I think Valmet has done a good and defined job. For the future, we will have a maintenance contract with remote support and aftercare, with one annual check by Valmet and a contract to define the level of spare parts.” ■

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A close-up photograph of a tiger's face, focusing on the stripes and the texture of its fur. The tiger is looking towards the right of the frame. The background is dark, making the tiger's fur stand out.

Stripes only suit tigers

The Mondi Steti Mill is passionate about performance. They aim for optimal printability that enables their customers to grab attention while offering the right packaging characteristics, like strength for the end user.

TEXT AND PHOTOS Kaisamaija Marttila

The crew at the Mondi Steti mill has mindset for continuous improvement and a strong vision of creating the best possible packaging solutions for their customers. The sack kraft paper- and specialty kraft paper-producing PM 7 started up in 2014, but the line struggled with quality issues from the beginning.

“We had irregularities in profiles and stripes on paper which were especially visible in the calendered grades,” says **Helmut Riesenberger**, Senior Project Manager, about the situation before the rebuild. “Due to quality

issues, we suffered time and material losses. We were unable to serve our customers in the best possible way. To fully resolve these issues, we decided to go for a big change and eliminate all the limitations of the existing machinery. So we chose Valmet and the OptiFlo headbox,” Riesenberger explains.

A perfect start-up

The new OptiFlo Fourdrinier headbox was installed during a 7-day shutdown in October 2017, and no civil works were needed. Steti’s new state-of-the-art headbox has dilution control and an internal attenuator. This ensures

CD profiles are now even, and 2-sigma values are significantly better.



➔ "Previously, we couldn't offer the full product range for printed grades. Now we can produce the full portfolio," says Ales Riegert, Paper technology manager.

⚡ "We wanted a headbox from a first-class supplier so we could serve our customers with the first-class quality they appreciate," says Helmut Riesenberger.



the flattest possible profiles and stable runnability. The start-up was easy and smooth. "We started the machine up and had sellable product on reel right away. That was perfect," says Riesenberger.

Three times better 2-sigma values

A look at the result suggests it was clearly the right thing to do. The CD profiles are now even, and 2-sigma values are significantly better. Formation is also better than before. The streaks and stripes are also history, and at the same time, printability has improved. "Previously, we couldn't offer the full product range for printed grades. Now we can produce the full portfolio," says **Ales Riegert**, Paper Technology Manager.

As the quality is more controllable and stable, the runnability and efficiency of the paper machine have also improved. With the new headbox, the mill has also noticed that grade changes can be executed more quickly. ■

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Remote finetuning from Valmet's Performance Center

"We supported the optimization of the new headbox operations and controls remotely from Valmet's Performance Center," says **Jukka Savolainen**, who works as a technology manager at the Performance Center. "Our Performance Center experts worked closely with Mondi's team to tune the system for optimal performance. Together, we resolved challenges related to quality and runnability, like the waviness of profile edge areas. We've noticed that this kind of remote start-up support is a fast and efficient way for our customers to reach target performance, and we're happy to have our best know-how available wherever our customers are."



Aiming higher

with an optimized
causticizing process

Article first published in Paper 360.

At Navigator Cacia's pulp mill, online liquor analysis and advanced process controls have resulted in reduced variation, improved efficiency and optimized lime dosage. Improved process visibility has also uncovered other areas of improvement. **TEXT AND PHOTOS** Mark Williamson

Online liquor analyzers and advanced process controls increase stability in pulping and recovery cycle operations, which improves operational efficiency and quality, and decreases material and energy consumption. As a secondary benefit, they also serve as a valuable diagnostics tool, uncovering previously unseen process instabilities and limitations.

This has been the case at the Navigator Company's Cacia mill in Portugal, which has an annual output of about 370,000 tonnes of bleached eucalyptus pulp, intended for processing into specialty papers such as high-quality décor, filter, cigarette and tissue paper. In 2018, Valmet commissioned a multi-point online recovery liquor analyzer and causticizing optimizer in the causticizing plant, resulting in significant process improvements.

All targets achieved

Fernando Martins, Recovery Plant Manager, summarizes the reasons behind the investment decision: "We planned to obtain better white liquor quality, stabilized causticizing efficiency, and sulfur and alkali indices, plus lime and natural gas reduction."

In achieving these goals, he sees an advantage in Valmet's comprehensive approach, which offers analytical

instrumentation, controls and an operator interface in one supplier package.

"We made a reference visit to a mill, where we saw the exceptional results that they obtained with this solution. It was the only equipment on the market with such good results," he concludes. He also notes that the project team "spoke the same language as the operators," thus promoting a successful outcome.

After only a few months of operation, the results of the project were seen in the increased stability of the entire process from green to white liquor, consistently higher causticizing efficiency, more stable white liquor with a higher active alkali and other operational benefits.

Sampling from green to white liquor

The process optimization controls are based on multiple online liquor measurements made by a Valmet Recovery Liquor Analyzer (Valmet Alkali R), which uses industry standard titration methods. The sampling intervals are prioritized in accordance with the process dynamics and the importance of the control strategy. The values of Sodium Hydroxide, Sodium Sulfide, Sodium Carbonate and Sodium Sulfate are measured at six locations, three for the green liquor and three for the white liquor. From these values, Effective Alkali (EA), Active Alkali



The mill's controls and operator interface are based on Valmet DNA, linked to an existing distributed control system (DCS).

Variability reduction and target optimization of Key Process Indicators

Key Process Indicator (KPI)	Manual Control	After APC	Improvement
Green Liquor TTA, g/l as Na₂O			
Average	126.7	127.7	+1.0 g/l
1 Sigma variation	3.27	0.57	-82.6 %
Causticizing Efficiency, %			
Average	78.7	81.0	+2.3 CE%
1 Sigma variation	2.71	0.85	-68.6 %
White liquor AA, g/l as Na₂O			
Before WL filter	107.8	112.8	+4.7 %

(AA), Total Titratable Alkali (TTA), Causticizing Degree (CE%), and Sulfidity (S%) are calculated and displayed as operator targets.

Stabilizing controls

The process stabilization starts at the dissolver, where smelt is diluted with weak white liquor. The combined chemical components of the green liquor TTA from the smelt and dilution white liquor are measured by the alkali analyzer. TTA optimizing controls continuously monitor the TTA correlation with density measurements, and the density setpoint is adjusted to keep the TTA constant. In addition to the TTA control from the dissolving tank, the TTA is fine-tuned just before the slaker.

Once the input of green liquor has been stabilized and the strength maximized, the control of the slaker is the most critical in the chemical conversion process, because it sets the initial reaction rate, which then carries through to the causticizing vessels and the final white liquor a couple of hours later. The ratio of lime to green liquor is determined by the rise in temperature from the green liquor to the top of the slaker. This deltaT is created by the exothermic reaction between lime and water. The control responds quickly to the quality of lime feed, regardless of the source. This control is supervised in a cascade loop by feedback white liquor measurements taken downstream.

This temperature rise model is used when the slaker is

not boiling. If it boils, the unknown part of the exothermic reaction energy is used to evaporate water. When this happens, another strategy must be used. At Cacia, the advanced process control switches automatically to the boiling mode to maintain white liquor quality.

Work in progress

The online measurements and advanced controls have stabilized the entire chemical conversion process and allowed the target shifting of key process indicators. With

The online liquor measurements and advanced process controls have allowed target shifting of key process indicators.

improved stability, overliming has also been eliminated.

Francisco Figueiredo sees the project as a success: “Valmet provided very good team support. They were always available and solved problems quickly.” Project Process Engineer **Fabio Branco** adds: “It was a very easy project. All the schedules were met. Navigator and Valmet worked together to solve every challenge.”

However, the improvements in the process will not end with the acceptance of performance guarantees. **Heikki Imelainen**, Valmet’s Senior Application Engineer, explains the project implementation philosophy: “We study the entire process when we tune any advanced process controls on the site – not only the area under control, but also all input materials and the process after the last control point.”

The mill staff and Valmet have worked together to diagnose some previously unseen process limitations which, when solved with the planned improvements, are expected to lead to further benefits and more return on investment. ■

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The Valmet Recovery Liquor Analyzer collects samples at six locations.



From machine rebuild to new quality control system

Valmet's capability to cover the entire project scope sealed the deal when BillerudKorsnäs Karlsborg's pulp mill was looking to replace their old quality control system. The package included a required machine rebuild and the installation of a new system for grammage and dry content control. **TEXT AND PHOTOS** Soren Back



The BillerudKorsnäs Karlsborg pulp mill in northern Sweden produces 330,000 tonnes of bleached softwood pulp annually, of which 130,000 tonnes are pumped to the integrated paper mill producing bleached sack paper, kraft paper and formable paper (FibreForm). The remaining pulp production is dried in the TM 3 pulp drying machine and sold as market pulp.

The mill has a long history with Valmet, and in 1980, Karlsborg was the second mill in the world to install a Valmet Damatic Classic distributed control system (DCS) for control of the fiberline, and later for electricity production and steam recovery.

When BillerudKorsnäs decided to replace its old quality control system in the drying machine with a modern new one, a rebuild after the dryer section was necessary to obtain enough space for the grammage and dry content scanner.

A machine rebuild and new system from the same supplier

“The previous quality control system in the TM 3 had exceeded its technical lifespan, and we could no longer get spare parts, so investing in a new system was necessary,” says **Bjarn-Olof Johansson**, Project Engineer at BillerudKorsnäs Karlsborg. “We had a long-term perspective for the new system regarding monitoring and control of

dry content and grammage profiles in the direction of the machine, and perhaps also the corresponding cross-direction profiles and even further properties. It was therefore important to get the best system for the future and avoid being trapped.”

“The machine is quite cramped, which meant that a rebuild after the dryer section was needed to make space for the dry content and grammage scanner. Various suppliers had different solutions for how this could be done and by whom, but Valmet was the only one that could take total responsibility for the entire rebuilding and control system package,” says **Mattias Arvidsson**, Project Leader at BillerudKorsnäs Karlsborg.

↑ Process Operator Jan Johansson at the drying machine cutter, where the bale set balance has been removed.

“Training of operators before and after the installation played an important role.”

“Of course, it’s a big plus for us in a project like this that we can cover the entire project scope,” says **Juha Mykkänen**, Sales Manager, Automation. “We don’t have to involve external mechanical partners, and we can offer a guarantee for the whole package.”

Thorough testing

“The project consisted of two parts, the rebuild after the dryer, including the required mounts, which we did during the maintenance stop in August 2017, and the installation of the Valmet IQ Quality Control System, which we did in October 2017,” Arvidsson says.

“It was a giant task for us to map all the signals in advance needed for a trouble-free system integration with the existing Valmet DNA System, as well as with the distributed control system (DCS) from another supplier. The DCS system controls pulp and steam flows, as well as machine speed and other parameters. The integration between these systems had to be done seamlessly, and the preparatory work was therefore very important. And we mustn’t forget the great importance of Valmet’s training of our operators before and after the new system’s installation.”

An important part of the project was that Karlsborg’s project group went to Tampere for a Factory Acceptance Test (FAT) of the drying machine’s Valmet IQ System. The aim was to check that everything was built, all process displays and controls were ready, and to follow up the project status.

The project group was very satisfied with the FAT results – both the technical side and how Valmet organized the tests. The Valmet IQ System for Karlsborg’s drying machine consists of a Valmet IQ One-Sided Scanner before the dryer, positioned above the pulp web, measuring dry content and temperature, one Valmet IQ Scanner, measuring grammage and dry content after the dryer and, of course, all the required software.

→ Mattias Arvidsson (left) and Bjarn-Olof Johansson at the scanner’s field cabinet.



↓ From left: Mikael Strand, Head of Section TM3; Bjarn-Olof Johansson, Project Engineer; Mattias Arvidsson, Project Leader; Jan Johansson, Process Operator, TM3 at the Valmet IQ Scanner after the drying section.

Start-up exceeds expectations

“The start-up went better than expected, and we had good support from Valmet’s start-up staff,” Arvidsson emphasizes. “Of course, there were some minor issues during the start-up period, but they were quickly sorted out. We can now control grammage and dry content profiles, as well as coordinate speed in the machine direction as the signals from the system influence the pulp flow, pressure in the headbox, machine speed and steam flow to the dryer.”

“Our fears that the relocation of the carrying roller might cause problems with the pulper during threading were proved totally unfounded – it all worked just fine,” **Mikael Strand**, Head of Section TM3 adds. “All in all, the project has run very smoothly, and the Valmet IQ System means we can see that the drying machine is now run in the same way, irrespective of different shift teams.”

Smoother process

“As we now have stable grammage measuring and dry content control, we’ve been able to remove one maintenance demanding unit in the drying machine, namely the old balance for bale set, which used to control the set change in the drying machine cutter,” Johansson points out. “Instead of weighing the set of pulp bales, the weight of each set is now calculated based on the measurement results from the Valmet IQ System, and the set change in the cutter is controlled. However, we still weigh each pack of pulp bales on a special pack balance, and this weight is the invoiced weight.”

“To sum up the whole project, we’re very satisfied with how it has been run and with the cooperation with Valmet. The result has been very good, and we look forward to continuing with the grammage profile in a controlled cross direction, as well as possibly another quality parameter,” Andersson concludes. ■

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Good
planning is
half the
battle

For the Borealis Polymers plant in Porvoo, Finland, regular automation lifecycle roadmaps have proved valuable in ensuring smooth process continuation. As part of their latest automation system migration, more than 3,000 centralized input/output (I/O) cards were successfully replaced.

TEXT AND PHOTOS Nigel Farrand

Automation upgrades and renewals at the Borealis Polymers plant, a fully integrated petrochemical complex, are based on long-term lifecycle plans drawn up by Valmet with Borealis. Regular automation lifecycle roadmaps condense the status of the existing system into a single graphic, using color codes to indicate spare part availability covering short-, mid- and long-term requirements. This focuses attention on upgrades that can be made before critical end-of-life conditions arise, with the possibility of budgeting well ahead of time and avoiding unnecessary maintenance or unplanned replacements.

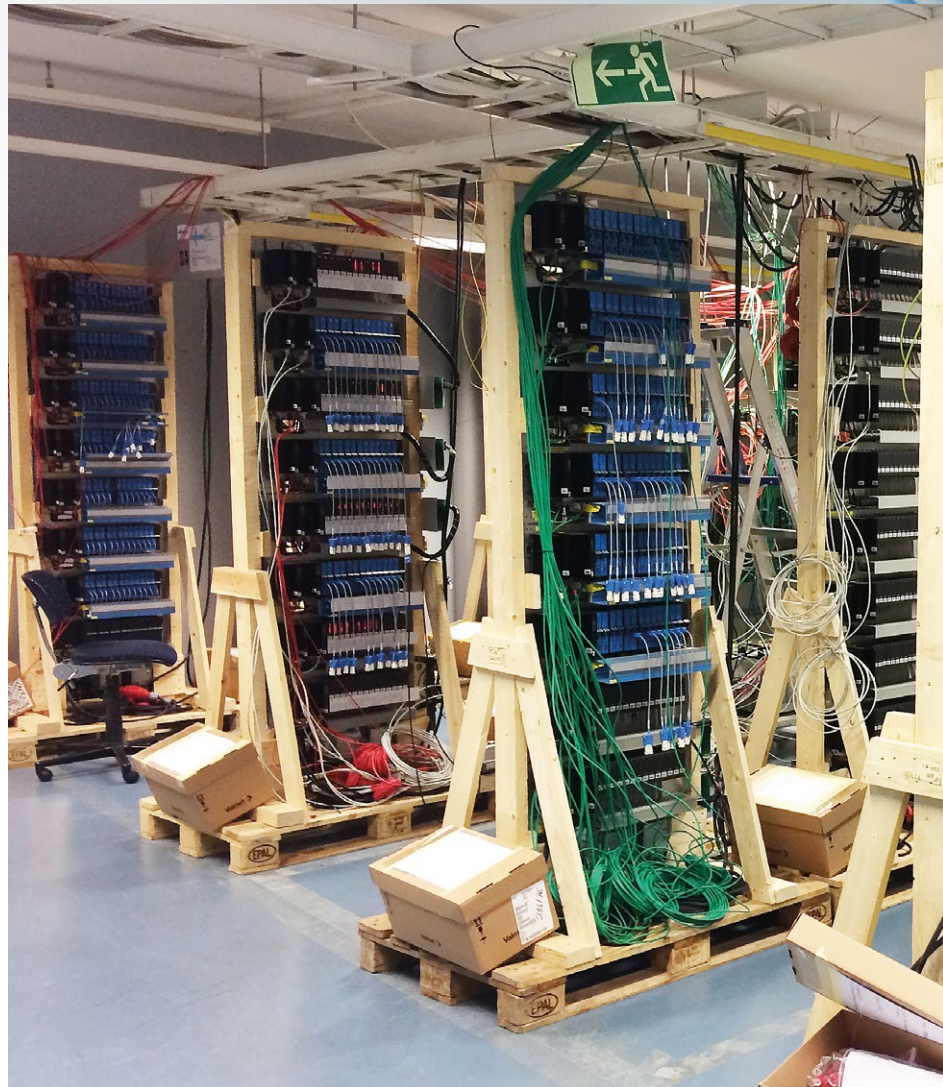
“This is really good support for preparing our own roadmaps, which also cover instrumentation and other devices throughout the plant. We’re already in discussion with Valmet about the 2022 turnaround,” says **Mika**

Etholén, the Borealis Senior APC Engineer, Technical Development and Engineering, Hydrocarbons.

Pilot installation a key to success

Control room and process stations had been upgraded in 2012, and planning for the next turnaround in 2017 was already in progress. “Valmet’s announcement in 2013 that centralized input/output card (CIO) spare part availability could only be guaranteed until the end of 2020 was a wake-up call,” says Etholén. “We hadn’t had any maintenance issues with the I/O, but there’s no redundancy, and the failure of a critical control could have shut the plant. With process turnarounds only every five years, a risk

Thorough planning enabled the replacement of over 3,000 centralized input/output cards ahead of schedule.



assessment had to be made as to whether we should go for replacement in 2017 or wait until 2022,” he continues.

It was decided to run a pilot project with three main targets: 1) to test the new Valmet DNA ATEX I/O cards in a real process environment; 2) to find technical solutions for how all old I/O cards could be replaced by Valmet’s new I/O units as efficiently as possible; and 3) to estimate the required time and resources.

The pilot project was successfully concluded in the spring of 2015 with the testing and implementation of the new intrinsically safe DNA ATEX I/O units with no significant technical problems. By using CIO adapters, Valmet was also able to deliver a solution for the replacement of old cards without extra cabling, which would save time and minimize risks in the bigger replacement project.

Comprehensive documentation

Most of the technical details for the process connections were resolved during the basic engineering phase, which





On a shared journey forward



Hannu Heikkilä



Henri Dyster

Hannu Heikkilä, Service Manager, and **Henri Dyster**, Senior Project Manager, worked with the customer during the project to achieve the shared goal of improving the system's availability.

"We've been collaborating with Borealis for more than two decades. With our systematic approach, we've created and regularly updated the lifecycle roadmap with the customer. The goal is to ensure availability and manage the lifecycle of the system cost-effectively and in line with shutdown schedules. This project was initiated using these lifecycle roadmaps," Heikkilä says.

"The project had a wide scope and a tight schedule. And since this was a pilot case, we also did R&D work during the project, which was sometimes a little challenging. Considering these factors, we managed the project well and got good feedback from the customer. I want to thank our great project team for this," Dyster continues.

Heikkilä and Dyster agree that close collaboration within Valmet and with the customer was an important factor in the project's success. The customer was very flexible, and there was good team spirit throughout the project.

↑ As the existing cabinets were to be used, the complete installation was assembled for testing on temporary wooden racks at Valmet's Tampere automation factory.

← "Valmet's automation lifecycle roadmaps are a really good support for preparing our own roadmaps, which also cover instrumentation and other devices throughout the plant," says Mika Etholén, Senior APC Engineer.

was done in 2016 before Borealis placed the main order. This thorough planning made it significantly easier for both parties to make a quick start on the project. Documentation is a major problem when replacing legacy systems, and although the field wiring and cross connections were to remain unchanged, some 6,800 field connection drawings needed to be checked and modified as required.

"The plant opened in 1971, so the documentation we had was a mixture of CAD and rasterized pictures, which meant that updating the I/O blocks couldn't be done by script but had to be done manually. With Valmet's help, all the circuit drawings have now been updated and stored in our SAP maintenance system," says Etholén.

Installation in just 8 days

With a comprehensive plan in place and resources assigned, 10 days were reserved during the 2017 3-week turnaround for installation. The final installation at the Porvoo plant took eight of the ten days allowed, with four installation teams working on the 31 I/O cabinets

right through the weekend. Because the storage tank area was in continuous use, the installation of the four new cabinets was staged loop by loop during 2018.

A good start-up

"Valmet performed very well during the entire project with their very skilled personnel. Since the turnaround, the start-up has gone well, and after a year, we've only had to replace three cards – just "infantile" failures in the first few months, which has been very good. Our maintenance personnel are also really happy now with the new I/O supporting HART and FDT/DTM data transfer from field instruments and valve positioners. They make their job much easier," concludes Etholén. ■

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Powering growth



For 25 years, Cikarang Listrindo has set the pace for Indonesian industrial development by supplying its customers with high-quality electricity. Its most recent Babelan plant runs with Valmet's circulating fluidized bed (CFB) boiler technology and plant-wide automation, providing stable and reliable supply.

TEXT Lisa Kettman-Kervinen **PHOTO** Robert Spour

ath



Right at the heart of the Bekasi Regency, around 40 kilometers southeast of Jakarta, three power stations are busy day and night. These are the power plants of PT Cikarang Listrindo Tbk, Indonesia's longest-operating private electricity supplier. Beginning operation in 1993, its customer base has grown to more than 2,400 companies in five industrial estates who have entrusted this supplier with the management of their power needs. Today, Valmet's technology and their plant-wide automation system are helping Cikarang Listrindo meet the growth in electricity demand from customers.

Growing with customers

"Our driver is the growth of our customers," says **Sami Sivola**, Station Manager at Cikarang Listrindo's Babelan plant. "We need to be able to continue to support them and provide more electricity with the highest reliability at a reasonable cost."

Starting with only two gas turbines and a plant capacity of 60 MW, the company has grown into a large local enterprise with three power plants, 760 people, and a total electricity capacity of 1,144 MW.

Cikarang Listrindo built its second MM2100 power plant in 2015, boosting total capacity by 109 MW. The newest Babelan power plant, coal-fired with two Valmet circulating fluidized bed boilers, started commercial operations in 2017.

Flexible and proven CFB technology

Circulating fluidized bed (CFB) boiler technology was selected for the most recent Babelan plant because of the

fuel flexibility it provides. The scope of Valmet's project was a complete boiler island – from fuel silos to stack, including steel structures, ducts, plates, platforms, piping, electrification, instrumentation, erection, commissioning, and start-up. Cikarang Listrindo looked after all the site preparation and foundation work.

CFB technology proved the right choice from the very beginning. The boilers have been running steadily within a full load range. The plant can source different quality fuels for its stock as they become available on the market.

New plant-wide automation

Valmet's plant-wide automation solution was part of the delivery. The initial delivery consisted of a Valmet DNA automation system, Valmet DNA Information Management and Balance of Plant (BOP), factory acceptance testing, commissioning and training.

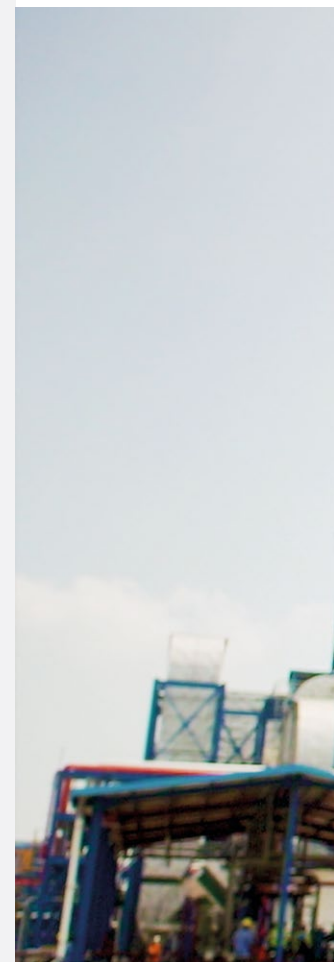
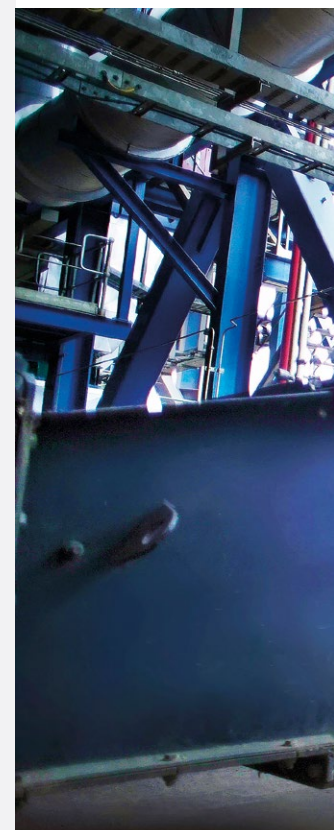
"We were looking for a supplier who could deliver the optimal solution, both technologically and financially. Globally, there are many potential suppliers of similar systems. However, we realized Valmet's solution was best for our needs. And the cost was very competitive compared to other suppliers," Sivola recalls.

Easy interface

"We are very happy with Valmet DNA," Sivola emphasizes. "It's user-friendly and extremely easy to operate."

"The graphical interface is one of the system's prime advantages. When the data is provided in such a visually convenient way, it makes it so much easier for the operators to always understand what's happening."

"When an unexpected event happens, the Valmet DNA allows operators to examine data and react immediately to ensure reliable power supply."





↓ "Our mission is to continue to grow. Our customers' processes should not be affected by diminished power quality, so they need a reliable and stable power supply no matter what," states Sami Sivola, Station Manager at Cikarang Listrindo's Babelan plant.





Circulating fluidized bed (CFB) boiler technology was selected for the most recent Babelan plant because of the fuel flexibility that it provides. The CFB process also provides excellent emission performance, achieved through relatively low combustion temperature and smooth temperature profile.

Improvement from the data

“One thing we especially appreciate about Valmet DNA is its Historian feature. It gives us a graphical representation of what happened in the past and why in a very informative and easily understood way,” says Sivola.

“When an unexpected event happens, you want to know why. What caused it? When you’ve identified the cause, you can take action to respond, thus avoiding the same unplanned situation occurring in the future. This helps prevent a small issue escalating into a major disruption,” he explains. “It’s also great that Valmet DNA Historian allows operators to examine data and react immediately. If something happens, you can analyze the situation, find the root cause, solve it and ensure safe operation conditions for reliable power supply to our customers.”

Performance optimization

In 2018, Cikarang Listrindo decided to add another handy feature to its toolkit – the Valmet DNA Plant Management Application. This application, which automatically calculates and presents performance, production and consumption data, is set to bring further improvements to the plant’s KPIs.

“The main idea behind integrating the new tool is performance optimization. With measured and monitored information on how the plant and different systems operate, you get essential data for improvements. And then there’s the reporting of course,” Sivola adds. “The new tool provides us with a quick and easy reporting system for our immediate needs.”

“Since the Plant Management application was commissioned in early 2019, no manual calculation has been required. All the data is automatically available to us whenever needed.”



← In 2018, Cikarang Listrindo decided to add another handy feature to its toolkit – the Valmet DNA Plant Management Application.

↑ “Valmet DNA is key to our safe and reliable operation. It allows us to utilize the full capabilities of any technical equipment,” says Sami Sivola, Station Manager at Cikarang Listrindo’s Babelan plant.

Safe, reliable and stable

“Our mission is to continue to grow. Our customers’ processes should not be affected by diminished power quality, so they need a reliable and stable power supply no matter what,” states Sivola.

“I think Valmet DNA is a good automation system – and it’s key to our safe, efficient and reliable operation. It allows us to utilize the full capabilities of any technical equipment. To get the best out of the power station, a reliable and accurate control system is needed, and we believe we have one,” he concludes. ■

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Winning together

Cikarang Listrindo’s Babelan plant utilizes plant-wide automation, based on the Valmet DNA automation control system. To optimize the plant’s performance, the system was complemented with a further feature – the Valmet DNA Plant Management Application (PMA).

“We listened carefully to the customer to understand the challenges they were facing and the targets they wanted to achieve. Working with the customer and Valmet’s specialists from Finland and Indonesia, we tailored the application to fulfill the customer’s requirement of a transparent power plant process,” explains **Elina Kleemola**, Valmet’s Product Manager of Plant Performance Solutions.

“At the end of the commission, our PMA specialists offered training to the operators and explained the calculation principles behind the application. They also provided additional DNA training to teach the customer to use the full scope of functionalities and features of Valmet’s Information System. Such close cooperation helped us win the customer’s trust,” says Elina.



INNOVATOR'S VOICE

Get inspired



With help of web-based technology, you can use the interface wherever you want, whenever you want – and with whatever device you want,” says Petri Tiihonen, Product Manager, Automation Strategic Programs & Product Management.

A person wearing a blue shirt is holding a tablet computer. The tablet screen displays a technical diagram with various lines and text, likely related to automation or industrial processes. The background is dark and out of focus, showing some green elements.

The next step in the new nature of automation

Valmet's first digital automation system was introduced 40 years ago. Over the years, the system has been further developed. The latest developments have been so revolutionary that today we are talking about the new nature of automation.

TEXT Soili Städter **PHOTOS** Kristian Broholm



Valmet DNA is an automation and information platform for process control. In 2018, Valmet was the first on the market to introduce web-based DNA Dashboards that visualized plant key performance indicators, providing users with an opportunity to access the information with mobile devices outside the traditional control room. In 2019, the renewal continued with the introduction of a new web-based Valmet DNA User Interface (DNA UI). The new user interface offers the users personalized information whenever, wherever and however they want it, while extending the use of the automation system to more users and roles.

Peter Hölzl, Valmet's Program Director, has been leading the development project. "DNA UI, the new interface, plays a central role in process automation. First,

we have to understand the user's work and then enable the individual to communicate collaboratively. We've worked with our customers to understand their needs and wishes, and plenty of new features have been developed to meet the technical and personnel demands of the future," Hölzl explains.

Right data in the right place

Each process involves a huge amount of data which has to be precisely controlled by the operators. The flow of historical, real-time and predicted data from each process, equipment and other systems can quickly become overwhelming, because more data is available for them to consider and analyze.

Process information is also needed outside the control room. From logistics and the laboratory to the board-



Unlike a traditional control room, the “control space” moves with users everywhere with their mobile devices.

room, the entire site community needs specific information about the process, but the right kind is not always easily available. At the same time, the ways of working are increasingly mobile. With Valmet DNA UI you don't have to stay in the control room to be on top of the situation.

From control room to control space

Since information can also be received outside the traditional control room, we talk about “control space.” It moves with the users everywhere they go, and mobile devices can be used to perform the necessary control, monitoring and reporting tasks. Control space empowers users and enables collaboration.

The control room set-up is transformed into a more transparent operation. Displays are arranged according to hierarchy levels, starting with the overview, then showing the operator's primary page during a normal working day. At the next level, details about the process or subprocess are presented. The final level presents detailed information about equipment and controls, interlocking and more.

“All in all, DNA UI makes work more collaborative. Customers can now utilize an innovative interface to make their business more effective. In this renewed user interface, we've really thought about people, their tasks and responsibilities, communication and ergonomics. DNA UI can easily be used in our existing installations, but also at completely new sites,” Hölzl says.

Personalized user profiles

“There are several features that make our new user interface attractive. It's web-based, and no installation is required. With the help of web-based technology, you can use the interface wherever you want, whenever you want – and whatever device you want,” states **Petri Tiihonen**, Manager, Automation Product Management.

Personalized user profiles and access control, as well as personalized pages and contents, enable effective work, but also give responsibility to the right people. Information is shared based on their requirements. This also leads to greater security protection. Certain areas are restricted, with user rights based on roles.

The control space presents challenges to cybersecurity, which has therefore been considered during development work. The DNA UI cybersecurity capabilities continue to build on the decades of cybersecurity development within Valmet DNA. Developers trained in security have

worked with cybersecurity experts to ensure that security is ingrained in the design process.

Tiihonen says: “Users are provided with personalized information for decision making. As a result, they are better aware of situations and able to make quick decisions. The intuitive UI also enables fluent collaboration with colleagues and customers.” ■

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At the forefront of digital evolution

Valmet has been at the forefront of developing digital solutions for its customers since the 1960s. In 1979, it took a giant leap forward by becoming the second company in the world to launch a distributed control system (DCS). It was then already possible to integrate various machinery control systems into the DCS. This technology has been continuously renewed and further developed. It is now called Valmet DNA.

The advanced DCS built a solid foundation for Valmet's digital development that is now continuing in the era of the Industrial Internet. The next step in digitalization has been to improve the visibility and profitability of the operations of a plant or mill by analyzing and utilizing data even more extensively for the customer's benefit.

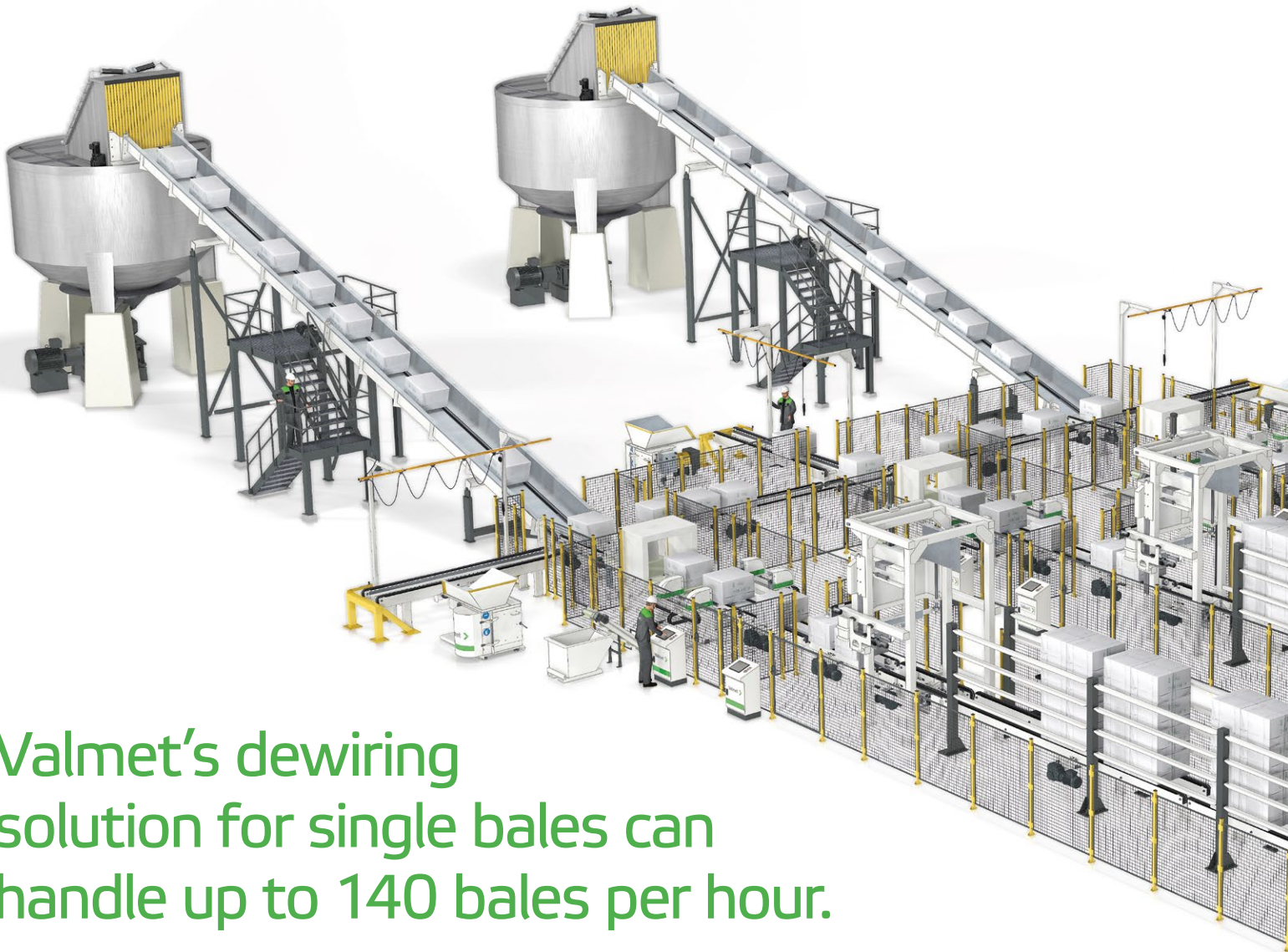
Benefits of DNA UI

- Better efficiency and control
- Fast operations with touch screens
- Increased situational awareness
- Trust in the system and an immediate understanding of what it shows
- Cooperation with the plant/mill community
- Empowerment to modify the user interface to match the user's preferences
- Advanced cybersecurity

The control room set-up is transformed into a more transparent operation. Displays are arranged according to hierarchy levels, starting with the overview.

Valmet Pulper Feed System

Safe, smart, efficient



Valmet's dewatering solution for single bales can handle up to 140 bales per hour.

Valmet's modularized pulper feed system is flexible and offers a suitable solution for any paper, board or tissue mill. It increases safety, availability and productivity while reducing lifecycle costs.

TEXT Kerstin Eriksson

Valmet has applied its long experience to developing a best-in-class pulper feed system. With more than 50 systems sold, we can ensure smooth and disruption-free operation while employees are respected and protected. Intelligence is built into the system, and with real-time access to monitored data, it has never been easier to optimize operations.

Safety comes first

Valmet's fully automatic pulper feed system offers higher productivity and efficiency, and improves staff safety by eliminating the risks associated with manual dewiring routines.

The main machines, used for dewiring and destacking, safely convert cut wire into compact recyclable coils. The installation is divided into safety zones. If anyone enters a safety zone, all power sources are interrupted, which ensures the highest possible safety for all employees. The safety system is always adapted to local safety laws and regulations before delivery.

"In designing pulper feed systems, we're always thinking about how to prevent accidents and injuries. If

the layout makes it difficult to operate the line, safety is sometimes neglected. It's therefore important to resolve the safety issue, but still make the line accessible and easy to operate," says **Mats Backlund**, Manager, Plant & Process Design at Valmet.

Smart system ensures quality

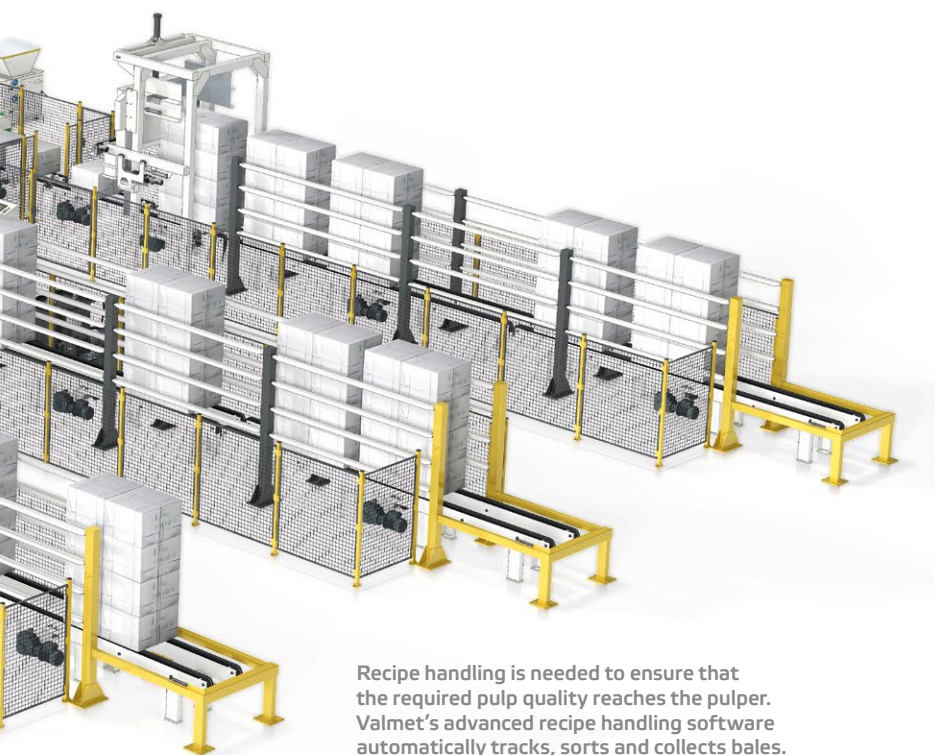
The intelligent system tracks each bale, bale set and bale unit throughout the line. Using absolute bale position tracking to ensure exceptionally reliable key data on production and quality, the system enhances efficiency, logistics and quality management.

Recipe handling is needed to ensure that the required pulp quality reaches the pulper. This can be a complex process for operators of manual recipe handling stations. Valmet's advanced recipe handling software automatically tracks, sorts and collects bales. The software calculates the mix of bales needed to ensure the required quality and guides the movement of bales to keep the production flow constant.

Efficient wire removal

The machines in the pulper feed system are delivered as ready-to-use units designed for fast installation and start-up. Efficient daily operation is ensured by the superior control system, featuring PLC control equipment, which is operated and monitored via a touchscreen with an easy-to-use graphic interface. Wires are efficiently removed from bale stacks and single bales. Conveyor systems connect the machines for recipe handling, storage, transportation and manual dewiring. The system is autonomous, which means operators are free to perform other tasks. Operators can stop the system without generating cumulative defaults, which create extra work.

"We have the fastest dewiring solution available for single bales, with rates of up to 140 bales per hour when cutting the commonly used 2+2 wire configuration. Whether it's automatic, semi-automatic or manual, our customers can always have a Valmet Pulper Feed System adapted to any special need and suitable tools to make operation as efficient as possible," **Per Jangdal**, Sales Manager at Valmet concludes. ■



Recipe handling is needed to ensure that the required pulp quality reaches the pulper. Valmet's advanced recipe handling software automatically tracks, sorts and collects bales.

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Roll covers from recyclable and renewable raw materials



Could paper machine roll covers be made of recycled or even bio-based raw materials? After less than two years' intensive R&D work, Valmet has introduced new composite covers for press, guide and calender rolls representing a new, more sustainable generation of roll cover materials.

TEXT Jani Turunen, Juha Ruotsi

PHOTOS Joonas Nieminen

Roll covers used in paper, board, tissue and pulp making need periodical renewal and thus consume tonnes of material resources. A major part of the raw materials used in roll covers – polymers, resins and other industrial chemicals – has traditionally been manufactured from fossil-based raw materials, and refined and processed from crude oil. The manufacturing methods for these raw materials may also have been energy consuming. Old roll covers have ended up in landfill or as energy waste.

A more sustainable future with a new generation of roll cover materials

Safety has always been the highest priority, and over the years Valmet has frequently replaced raw materials in roll cover production with safer alternatives. Where raw material selection was previously heavily guided by worker safety, Valmet is now taking a giant leap toward a more holistic approach with a focus on sustainability, aiming to

The target is to produce roll covers based on 100% recycled or bio-based raw-materials.

replace as many of the roll cover raw materials as possible with more sustainable alternatives. The target is to use recycled materials and renewable resources, and more broadly to save energy.

Using recycled consumer plastic or glass as the reinforcing fiber or filler in composite roll covers, or bio-based resin and hardener in the polymer matrix, are good examples. The benefits of recycling are easy to understand, but what about bio-based materials?


“They remove the dependency on crude oil,” states Dr. **Jani Turunen** from Valmet. He continues: “We only approve renewable materials derived from non-food chain plants or plant parts, meaning their use does not affect global food production. Cultivation and harvesting of plants must not endanger the growth of natural forests either. In the best cases, bio-based materials can be produced from plant parts that would otherwise be waste. Lignin, carbon black made of lignin and nanocellulose are good examples, and all three can be utilized as reinforcing fillers in roll covers.”

Innovativeness and a strong R&D pay off

After less than two years of intensive R&D work for sustainable roll covers, Valmet is ready to present the first more sustainable composite covers for press, guide and calender rolls. The content of recycled or bio-based raw materials is between 75 and 96 percent in these covers, but new materials are being continuously tested, and the target is to reach 100 percent as soon as possible.

Work is also being done on polyurethane and rubber covers, and their first customer prototypes may already be available later this year. Last but not least, studies are also ongoing on how the scrap material from removed covers can be optimally recycled or utilized.

“We’ve already been in touch with companies that



“Lignin, carbon black made of lignin and nanocellulose are good examples of by-products that can be utilized as reinforcing fillers in roll covers,” states Jani Turunen, Manager for Roll R&D, Valmet (right) pictured with Pertti Hytönen, R&D engineer, Valmet.

are breaking the rubber (tires) down back to oil, carbon black and fuel with the help of their pyrolysis process. The carbon black could then be recycled to produce new rubber roll covers,” reveals Turunen concerning Valmet’s future plans.

No need for compromise

When we’re talking about more sustainable alternatives and recycled products, it’s relevant to ask about product performance. Valmet’s R&D work shows very promising results here too.



“We were actually surprised with the laboratory results we obtained from these sustainable covers. Some of the properties, like wear resistance, were even better than with our standard roll covers,” says R&D Engineer **Pertti Hytönen** with a broad smile. “Of course, we’re still at the beginning, and creating products as good as our state-of-the-art offerings may take a few years. But even in those products at least some of the raw materials can already be replaced with more sustainable options.”

Examining the most important roll cover properties and requirements – for example, in the results achieved in

pressing or calendaring – shows that users don’t need to compromise on product performance.

Make a difference to our environment

To summarize, the benefits of sustainable roll covers are clear: good performance in the papermaking process and a solid way for paper companies to prove they are acting to make planet Earth a better place for future generations. ■

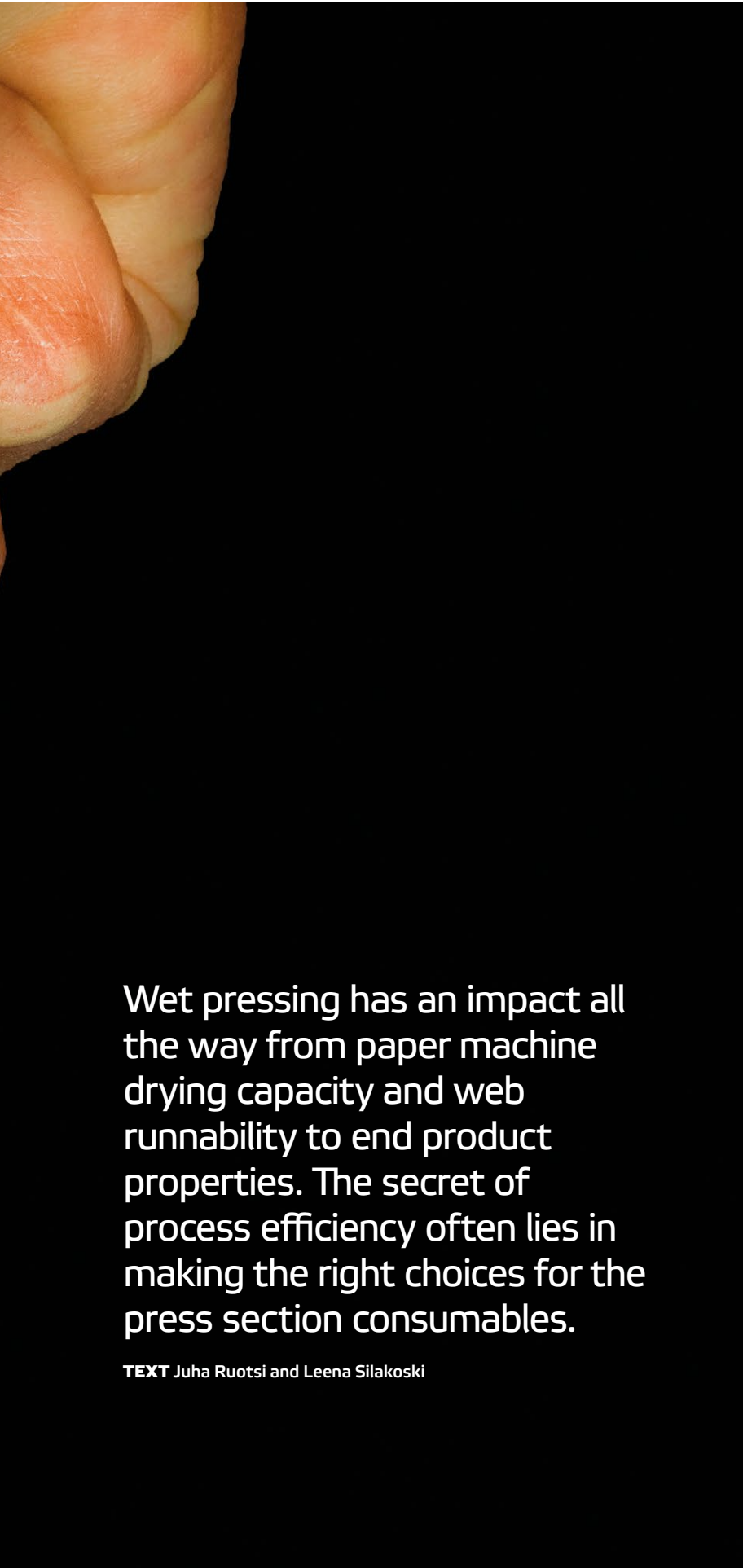
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Making the right choices to boost
**wet pressing
efficiency**



Wet pressing has an impact all the way from paper machine drying capacity and web runnability to end product properties. The secret of process efficiency often lies in making the right choices for the press section consumables.

TEXT Juha Ruotsi and Leena Silakoski

When the sheet arrives at the press section from forming, the dry content level is about 20 percent. In the press section, the sheet dry content increases to about 50 percent as pressure removes the water from the sheet. Simply put, the water from the sheet is pressed into the press felt, which either carries it into the Uhle box, where it is sucked in by the vacuum (Uhle box dewatering), or removed from the sheet to the nip, and through the felt into the grooves of the roll by centrifugal force (nip dewatering).

Press section consumables offer many ways to efficiency improvements

There are many parameters which affect the wet pressing process, providing plenty of options for optimization and improvement. These include machine and runnability issues, such as nip pressure, press felts and shoe press belts, as well as rolls and roll covers.

Typically, press dewatering improvement in machines using the oldest equipment technologies requires significant capital investment – in a shoe press rebuild, for example. However, basically all press sections, despite their current equipment level, also embrace improvement potential through lower investment. But how?

Optimization of press section consumables can significantly improve wet pressing efficiency.

The answer is easy. Every machine consumes press felts, roll covers, doctoring products and many other consumables that demand periodic replacement. So why not optimize them as part of their regular service?

Typical areas of improvement related to machine consumables

1) **Optimal nip and Uhle box dewatering:** Nip dewatering offers benefits such as shorter felt break-in time and the possibility to allocate vacuum capacity to other needs

besides Uhle boxes. The most efficient dewatering process typically combines both nip and Uhle box dewatering. In addition, felts play a key role when adjusting the dewatering direction between nip and Uhle box dewatering. On rolls and belts, the open area on the roll surface allows for adequate handling of the water from the felts.

2) Nip pressure level and nip pressure CD profiles: Web CD moisture profiles can be enhanced by the optimization of roll crowns and settings with deflection compensated rolls. Insufficient nip pressure levels and profiles shorten roll and felt lifetimes, and decrease production efficiency due to extra maintenance shut downs.

3) Nip vibrations: Nip vibrations often originate from rolls and felts, and may be corrected with optimization. Vibration problems especially affect machine runnability and roll maintenance requirements.

Examples of wet pressing optimization in practice

A simple target is to improve wet pressing efficiency by changing the dewatering direction. Conventionally, redirecting refers to shifting from felt to nip dewatering. This means that instead of vacuuming, more water is conducted via the voids onto roll surfaces and water collection pans. The typical benefits include improved dewatering, faster felt start-ups and optimized use of vacuum capacity. To achieve these results, the felt and pressing rolls must be aligned. In practice, this consists of adjusting roll cover hardness, roll surface groove and hole patterns, and felt permeability and density. All directly connected equipment must also be checked and further adjusted.

The prevailing situation often has several areas requiring improvement. This is even more challenging, because in many cases improving one area causes deterioration in another. Take a machine producing fine paper: The general aim is to improve dewatering to save drying energy costs. However, emerging issues include suction roll

Examples of results achieved

- 1) A paper machine speed increase by 30 m/min
- 2) Total drying energy consumption down by 6%
- 3) Number of breaks at press section down by 50%
- 4) A felt lifetime increase from 30 days to 50 days

shadow marking, CD moisture profile and press vibration problems, as well as suction press roll hole clogging. This extensive range of problems leads to a situation where success can only be achieved when the timing of actions, the magnitude of adjustments and the team's goals are perfectly balanced and aligned.

The power of teamwork and service agreements

The power of teamwork cannot be understated when discussing improvement projects in the press section. The biggest obstacle in running improvement projects in the given time and with the desired results may not be related to technical questions but to the efficient cooperation of people from different departments and companies. Production, maintenance, purchasing, engineering, process technology, finance – you name it – all these operations have their own features and incentives in how work and business should be undertaken.

To make things clear for all parties, a Valmet service agreement with integral press section performance improvement may be a beneficial solution. The agreement usually contains the regular service operations for a certain period and the improvement project based on the customer's requirements. The idea is to create results and share the spent resources risk through mutual understanding. ■

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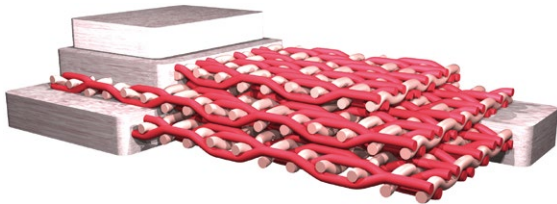
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Wet pressing optimization success stories

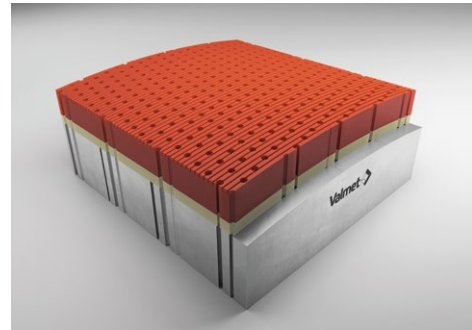
Customer	Results	Read more
Thai Cane Paper	Steam consumption decreased from 45.6 tonnes to 40.2 tonnes/h	https://www.valmet.com/media/articles/services/improving-press-performance-step-by-step/
Cartiere del Garda	Machine speed increased by 30 m/min; press felt lifetime increased from 30 d to 50 d	https://www.valmet.com/media/articles/up-and-running/performance/FPiRollGarda/
SsangYong C&B	5 percent decrease in steam consumption	https://www.valmet.com/media/articles/services/ssangyong-cb-optimizes-tissue-press-nip-efficiency/
Vijay Anand Kraft Papers	Web dryness after press increased from 49 to 51 percent	https://www.valmet.com/media/articles/services/vijay-anand-kraft-papers-excellent-roi-with-valmet-press-roll-cover-pp/
Green Forest Paper	Machine speed increased by 60 m/min	https://www.valmet.com/media/articles/services/presspolar-eliminates-production-bottlenecks-at-green-forest-paper/

Valmet key offering for wet pressing optimization



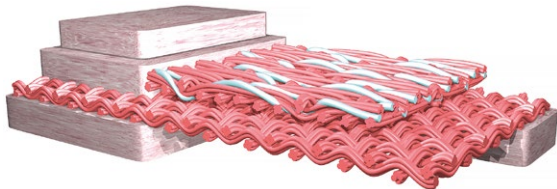
Press felts

Typical felt for efficient Uhle box dewatering (Valmet Press Felt LMR) with a heavy open structure and a high void volume.



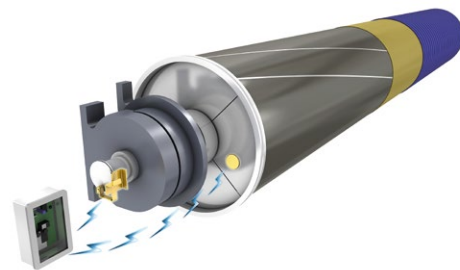
Press roll covers

Valmet Press Roll Cover PF-V for suction press rolls with tailored hardness and surface topography for efficient dewatering.



Press felts

Typical felt for effective nip dewatering (Valmet Press Felt SPM) with a light but denser structure, low in void volume and caliper.



iRoll measurements

The Valmet iRoll product family for profile improvements. Unique tools to measure nip pressure profiles in real running conditions to enable the appropriate correction actions for better efficiency and quality.



Belts for shoe presses

Valmet Black Belt with tailored surface topography for efficient dewatering.



Roll upgrades

Valmet Suction Roll Upgrade Shell Flow H: Suction roll hole cleaning system for enhanced dewatering.



EXPERT'S VOICE

Food for thought



Jari Almi, Vice President,
Industrial Internet at
Valmet.

Predicting the future using data

Instead of typical production planning and control, data-driven applications incorporating artificial intelligence (AI) help us take a more holistic view of the entire chain of production by utilizing data from several sources. While Industrial Internet applications can be used to instantly optimize processes, they also allow us to predict what's around the corner. **TEXT** Vesa Puoskari **PHOTOS** Tomi Parkkonen

“**T**omorrow's successful companies will increasingly base their decision making on insights, predictions and prescriptions provided by artificial intelligence applications,”

emphasizes **Jari Almi**, Vice President, Industrial Internet at Valmet.

“In practice, this means, thanks to AI-based applications and machine learning, it will be possible to predict upcoming variations and incidents, make decisions based on predicted events and act proactively. This approach is valid for production, maintenance and business too,” he explains.

Simply put, the benefit of advanced analytics is that it can recognize abnormal behavior, repeating patterns or a chain of events in large data volumes leading to a certain incident in the future. By recognizing these patterns, it

can predict when the same incident is likely to reoccur and alert the user in advance. In future, artificial intelligence will likely also replace the operator and fill the best setpoints automatically in the system.

Toward more autonomous operations

“Thanks to the more predictive nature of the available information, it's possible to gain better control of the daily work in a mill or plant by pre-planning activities and running the process with fewer resources. This is a fundamental change and will lead to a more autonomous mill or plant.”

“Nowadays, operators run machines based mostly on historical data and their experience of the best running parameters and setpoints. A lot of real-time data is available from the automation system, but data use is mostly limited to controlling the process. This is because it's

impossible for a human to analyze thousands of data points at the same time and recognize repeating patterns in them. In the future mill or plant, it will be possible to manage and optimize mill-wide operations through data-driven applications by combining and analyzing data from various sources,” says Almi.

Utilizing data from several sources

In practice, there are several useful data sources across mill operations and the entire value chain: a machine and process automation system with a lot of data from the equipment and production, quality data from the laboratory, maintenance management systems and business data, including Enterprise Resource Planning and Manufacturing Execution Systems.

The machine and process automation systems are a key data source. Combining this data with maintenance and business data will provide a new dimension to make machines more intelligent. “At Valmet, we’re looking for ways to connect Valmet machinery, systems and fleets equipped with advanced sensors, controls and software applications. Combining the data with our process and machinery knowhow will enable us to leverage the embedded intelligence in the main process equipment for more predictable and

autonomous operations,” explains Almi.

This embedded intelligence will provide a more detailed status for each piece of equipment, and its need for maintenance and spare parts. “We want to reduce unplanned downtime and optimize maintenance. For example, when we can predict upcoming machine failures early enough, the maintenance team can proactively plan the required actions before the next shutdown. Preventing equipment failures happening brings real business value to customers.”

This allows a move from scheduled equipment maintenance to outcome-based maintenance.

“Based on prescriptive analytics, the system can indicate how to run or modify the machine to ensure it’s safe to extend operations until the next planned maintenance break. Our future vision is for the system to autonomously recover from detected problems by changing its own settings to adapt to the predicted problem.”

A holistic view of the entire production chain

The key aim of big data analysis and related AI-driven applications is to learn from historical data and to take all interactions better into account, even within a single process area or throughout the



“Thanks to the more predictive nature of the available information, it’s possible to gain better control of the daily work in a mill or plant by pre-planning activities and running the process with fewer resources. This is a fundamental change and will lead to a more autonomous mill or plant,” says Almi.

“Industrial Internet applications allow us to predict what’s around the corner.”

wider horizontal value chain. Instead of the traditional approach of adjusting and optimizing the mill mainly at the process area level, the target is to understand and manage the production system as a whole.

“For instance, in an ideal situation, we combine data from pulp mill, paper machine and converting processes and apply a mill-wide operational control solution, enabling the customer to optimize manufacturing costs, product quality and productivity across the mill,” says Almi.

“Thanks to new technology, we can model the mill’s entire production chain and optimize it accordingly. When orders are available in the production planning system, we know what kind of final product should result from the process at each moment and can cascade the best setpoints to all upstream process areas, based on the final product specification.”

“By combining and utilizing data from several mill systems, it’s possible to identify the most profitable way of turning incoming raw material into final sellable products,” Almi explains.

How to get started

The best approach to seeking value from the data and getting development started is to initiate a data discovery process utilizing a batch of historical data, e.g. from the mill information management system. Data discovery makes it possible to find a root cause of an identified problem or to take a more holistic approach to finding improvement potential in the production process by utilizing historical data. Typically, data discovery takes six to eight weeks, and engages Valmet’s data scientists and process specialists in collaborating with the customer’s specialists to get everything out of the data. The outcome of data discovery is not only limited to a final report; typically, a data-driven advisory application is also created during the process to address the discovered improvement opportunity.

“Data discovery helps customers to understand the root cause of the identified issue or to take a holistic approach to the process area or mill improvement, relying on big data historical analysis. Understanding the root cause and chain of events leading to a certain incident from the data enables us to develop an advanced algorithm to recognize and predict the same issue from online data,” Almi explains.

Valmet also uses accumulated historical data to verify the feasibility of the selected advisory or predictive applications for the customer’s process. Verifying application usability with a batch of historical data allows fast and risk-free implementation of data-driven applications for both parties. Once this is verified and the results are agreed, it’s time to move into the continuous service phase by implementing data connectivity and making online appli-

cations. The final step is therefore to incorporate the application in the customer’s daily operations to support performance and reliability development.

“We’ve been digitalizing our customers’ production processes for the last few decades. Now it’s time to take another step and leverage data from digitalized processes for the digital transformation of processes and businesses. In our experience, change management plays a key role when companies are adopting new data-driven applications incorporating artificial intelligence. While digitization is technology-driven, converting analog systems into digital systems, digitalization is more about utilizing the data and the latest technology to make processes more efficient and enable new business models. So there’s always a human perspective connected with digitalization. If new advisory applications and other technology enablers are not integrated properly with daily operations and processes, it’s impossible to achieve the desired level of value from the change.”

Almi notes that the move to a more autonomous mill will highlight the importance of operators’ capabilities instead of abandoning them.

“Operators must be able to understand how the whole system works, because they’ll have more extensive tools at their disposal. They’ll be more responsible for reliability, performance and the quality optimization of the production processes than they used to be. It’s also predicted that the recent developments and digitalization will enable a gradual shift from a traditional line organization to a real process management model.”

Predictability increases efficiency

All told, artificial intelligence will play a major role in the future mill or plant, but it will be a long time before it replaces the role of experts. The best results can be achieved by engaging people working with the new technology through an agile development approach. Instead of multi-year development projects trying to solve all the issues at once, new opportunities should be explored step-by-step and by learning on the go to achieve the vision of the more autonomous mill of the future.

“Ultimately, empowering our customers to move toward an autonomous plant or mill will result in significantly more efficient production processes. Mills and plants will be able to operate more cost-effectively, decrease their use of raw materials and boost output at the process and plant levels. The ultimate goal is that data-driven applications incorporating artificial intelligence will converge with process automation and other mill control systems, and take over controlling setpoints for the optimization of manufacturing costs, product quality and productivity mill-wide,” Almi concludes. ■

Around the world

A TwinRoll dewatering press for Metsä Board in Finland

Valmet will deliver, install and start up a TwinRoll™ dewatering press for Metsä Board's Joutseno mill.

An extensive paper machine grade conversion rebuild for Stora Enso in Finland

Valmet will supply an extensive paper machine grade conversion rebuild for Stora Enso at its Oulu mill. In the project, originally Valmet-supplied paper machine PM 7 will be rebuilt to produce high-quality virgin-fiber-based kraftliner grades.

An optimization solution for Helen Ltd.'s district heat production and network in Finland

Valmet will supply an optimization solution for Helen Ltd.'s district heat production and network in Helsinki. The system will enable the company to improve the energy efficiency of its district heating network, and reduce emissions and costs.

A biomass boiler and a flue gas treatment plant for BS Energy in Germany

Valmet will supply a biomass-fired boiler and a flue gas treatment plant for BS Energy's combined heat and power (CHP) plant in Braunschweig. The primary target of the investment is to replace the coal-fired boiler.

Automation and solids measurements for HSY's wastewater treatment plant in Finland

Valmet will supply automation and solids measurements for the Helsinki Region Environmental Services Authority's (HSY) new wastewater treatment plant, which is under construction in Espoo's Blominmäki bedrock.

A biomass pretreatment system for PRAJ Industries in India

Valmet will deliver a biomass pretreatment system to PRAJ Industries for their second-generation biorefinery project, which is under execution.

A coated board machine to Graphic Packaging International in the USA

Valmet will supply a coated board machine for Graphic Packaging International's (GPI) mill in Kalamazoo, Michigan. With this investment in the latest coated board technology, GPI is committing to sustainable packaging with exceptional product quality and cost competitiveness for producing coated recycled board (CRB) grades.

What is happening in the global pulp, paper and energy industries? *Around the world* demonstrates some of the events and projects where Valmet has worked together with customers to move their performance forward.

Boiler diagnostics systems for Outokumpu in Finland

Valmet will supply boiler diagnostics systems for Outokumpu's Tornio ferrochrome plant. The solution is a critical part of the plant's process monitoring, enabling real-time visual monitoring of alloy manufacturing.

Exhaust gas cleaning systems for COSCO SHIPPING Lines in China

Valmet will supply exhaust gas cleaning systems (scrubber system) for ten container vessels of COSCO SHIPPING Lines Co., Ltd. The project will be executed in cooperation with Health Lead Development Ltd.

A forming section rebuild for Ajin P&P in Korea

Valmet will supply a forming section rebuild, introducing a novel Sleeve Roll technology, for Ajin P&P's Dalseong mill.

A board machine for JK Paper Limited in India

Valmet will supply a board machine with an extensive automation and Industrial Internet package for JK Paper Limited's Fort Songadh mill.

A boiler diagnostics system for Shandong Sun Paper in China

Valmet will supply a boiler diagnostics system for Shandong Sun Paper Industry Joint Stock Co., Ltd.'s new recovery boiler to optimize its availability and operation.

An automation system and measurements for Xuzhou Zhongxing Paper in China

Valmet will supply a Valmet DNA automation system and measurements to Xuzhou Zhongxing Paper Co., Ltd. The system and consistency transmitters will be installed on the company's PM1 paper machine.

A board machine rebuild for ITC Limited in India

Valmet will supply a board machine rebuild for ITC Limited at its Bhadrachalam mill. The rebuild of board machine PM 7, currently producing folding boxboard, is designed to substantially increase production capacity and offer new quality features.

Renewal of performance agreement with Whakatane Mill in New Zealand

Valmet and Whakatane Mill Ltd have signed a multiyear agreement for continuous performance service for Whakatane PM3 board line in New Zealand.

An extended roll service agreement with SCG Packaging in the Southeast Asia region

Valmet and SCG Packaging have signed a two-year roll recovering service agreement to serve all SCG's subsidiaries in the Southeast Asia region, which include Siam Kraft Industry Co., Ltd., Thai Cane Paper Public Co., Ltd., Thai Paper Co., Ltd., Phoenix Pulp & Paper Public Co., Ltd., and Vina Kraft Paper Co., Ltd.

Two Defibrator systems for Heze Baishida Wood and Jiangsu Ronghui Wood in China

Valmet will supply two Defibrator™ systems to the Baishida Group in China, one to Heze Baishida Wood and the other to Jiangsu Ronghui Wood.



About Valmet

Strengthening our positive quality culture

We are committed to high quality in our operations, and in the products and services we provide to our customers. We fulfill our commitment by executing our Quality Strategy and further developing our quality through twelve quality development roadmaps. One of them aims to strengthen our quality culture and the positive approach embedded within it.

We believe that a positive approach to quality makes us an even more attractive partner for our customers. Our starting point is that we always put the customer at the center. As we see it, quality is defined by our customers, so we need to work very closely with them to understand their needs and meet their expectations.

Perceiving customer feedback as a valuable source of information that helps us to improve the quality of our products and the services we offer customers is one element of a positive quality culture. Another is that we are always keen to learn from mistakes – to see them as opportunities to do things better and better every day.

Supporting management commitment

We work systematically to ensure a quality culture that is both strong and positive. We want to create a work environment in which our people hear their peers talk about quality, see them make quality-focused decisions, transfer quality thinking from peer to peer and feel quality around

them. This is why we have chosen to place special emphasis on ensuring management commitment.

“To support managers in their role, we’ve defined the quality-related responsibilities of a Valmet manager. Seeing quality as a business target and prioritizing leadership are two of the things included in our definition. Others include monitoring and following up quality performance, putting clear quality roles and responsibilities in place, and empowering team members to make quality decisions,” says **Juho Puttonen**, Vice President, Quality at Valmet.

Communicating quality is essential

Communication of clear and relevant quality messages at team level is also one of the manager’s key quality-related responsibilities. Managers are also encouraged to include quality as a regular agenda item at team meetings and allow it to be easily brought up in daily dialog with their team members.

However, to further support and promote the quality mindset of all our people – and to remind everybody that they play an important role in making high quality

happen, we also communicate quality messages at the company level.

“This fall, for example, employees from all over Valmet have shared their views on quality and the actions they’ve taken to make high quality happen in their daily work. This material is included in the Valmet Quality Story and is available as presentations, videos and roll-ups for everybody,” says Puttonen.

Maintaining the positive approach

To further enhance positivity and highlight the positive results of our quality work – often achieved in partnership with our customers – sharing success stories and best practice is encouraged. More effort is also devoted to giving positive feedback, as well as to recognizing and rewarding quality actions and initiatives.

“All in all, we see it as very important that our people have the relevant skills and competences needed to understand and deliver high-quality products and services, and continuous improvement. To ensure this, we’re including quality issues in our internal training programs,” concludes Puttonen.

Valmet is a leading global developer and supplier of services, automation and technologies for the pulp, paper and energy industries. Our more than 13,000 professionals around the world work close to our customers and are committed to moving our customers' performance forward – every day.

Valmet quality culture





About Valmet



I make high quality happen by inspecting every roll and correcting possible faults before customer delivery.

Anuwat Wanichakornkul, Balancing Operator, Laem Chabang, Thailand

I make high quality happen by ensuring engineering output with the help of a quality guarantee plan and process.

Tian Meng, Product Technology Support Supervisor, China



For me, high quality means optimally fulfilling all the customer requirements and even thinking about what the future requirements could be.

Jean-Michel Nadeau, Project Manager, Trois-Rivières, Canada



Valmet employees from all over the company have shared their views on quality and the actions they've taken to make high quality happen in their daily work as part of the Valmet Quality Story.



I make high quality happen by following the instructions in production orders.

Sílvia Tavares, Sewing Machine Operator, Ovar, Portugal

For me, high quality is a fundamental principle and knowing the entire work process.

Mayara Santos, Planning Board Assistant, Araucária, Brasil



I make high quality happen by planning my work carefully and working according to plan.

Mikko Raiko, Product Engineer, Tampere, Finland

Forward

VALMET'S CUSTOMER MAGAZINE

FORWARD

Valmet's customer magazine

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Valmet Industrial Internet Let's start a meaningful dialogue with data



Valmet's Industrial Internet services are based upon a meaningful dialogue with data. Turn your data into a valuable asset with our know-how in process technology, automation and services.

Our experts know which data to analyze and how to utilize it. Together we can make tangible improvements to the performance of your mill or plant.

Let's move forward and start a dialogue with data today!

Read more: valmet.com/dialoguewithdata

