For us, the Industrial Internet is evolution, not a revolution.

Valmet has a long history of developing digital solutions and services to the process industries. The background lies in the 1960s with the launch of our first automation solutions. Over the intervening decades, we have continuously introduced new digital solutions to our customers, from embedded intelligent information systems for production processes in the 1990s, through introducing 24/7 remote services for preventive maintenance in the early 2000s, to providing remote analysis to improve productivity, raw material efficiency and to optimize end product quality since 2010. Today, our customers enjoy solutions that improve their performance with the help of benchmark data and best practices.

Valmet’s long history in process automation has allowed us to become a pioneer in the Industrial Internet today. For us, the Industrial Internet is evolution, not a revolution. We constantly develop new digital solutions to move our customers’ performance forward by utilizing our unique combination of process technologies, automation and services.

While enjoying the benefits of this development, information security is a thing that can never be compromised. A high level of information security requires the right technical solutions, well-functioning processes, and competent and aware personnel.

In this magazine, we highlight how customers are already benefitting now from our Industrial Internet solutions. The Industrial Internet is evolving rapidly, and we cannot yet know all the solutions that will be available in the coming years. The direction is, however, clear – Forward!
In brief

Automation for Porvoo Energia’s biomass-fired boiler plant
Valmet will supply automation for Porvoo Energia Oy’s biomass-fired boiler plant currently under construction in Loviisa, Finland. The automation will be commissioned in late April 2016.

Valmet’s automation system is an overall easy solution for us since our operators and automation maintenance personnel are familiar with it. Our choice was also affected by Valmet’s local support and previous successful projects,” says Marko Heinikälli, Automation Supervisor at Porvoo Energia Oy.

The new 10 MW biomass-fired boiler plant will increase Porvoo Energia’s district heat production capacity and will be the main production plant in Loviisa’s district heating network. It will be fueled with bark and wood chips.

Key technology to SCA’s Ostrand pulp mill expansion
Valmet has received a major order to deliver cooking, fiber line and evaporation plant to SCA’s Ostrand pulp mill in Türrä, Sweden. This delivery is part of SCA’s investment to upgrade the mills production of bleached softwood pulp pulp from 430,000 tonnes to 900,000 tonnes per year. The last start-up of the renewed pulp mill is scheduled for May 2018.

“This major agreement with SCA is a strong continuation of Valmet’s and SCA’s long-term cooperation. The project has a significant employment impact to Valmet in Sweden, since a significant part of the equipment will be engineered and produced in our ‘Swedish units’,” says Bertel Karlstedt, President, Pulp and Energy business line, Valmet.

Fourth tissue line to Fine Hygienic Holding in Abu Dhabi
Valmet will supply an Advantage DCT 280TS tissue line to Fine Hygienic Holding (FHH), one of Nuqul Group’s companies. The new line, including a complete delivery package from stock preparation equipment to rewind, will be installed at FHH premises at Al Nahda mill in Abu Dhabi and will start operation in the first quarter of 2017.

The long partnership between FHH and Valmet goes back to 1986. Three Valmet tissue machines have already been installed at the FHH mills – Al Bardhi Paper Mill and Al Sindian Paper Mill in Egypt and Al Shobor Paper Mill in Jordan.

“We at Fine Hygienic Holding do not only look for technology when choosing our suppliers, but for forging strong long-term partnership that will enable us to grow together,” says Hani Naqdi, the Chief Officer of Strategic Industries at FHH.

Marusumi Paper relies on Valmet’s press section technology
Valmet will supply a paper machine rebuild to Marusumi Paper’s Ohe mill in Japan. The rebuild includes a new press section utilizing Valmet’s modern shoe press technology. The rebuilt machine will be started up during fourth quarter of 2016.

“In further meeting the lighter weight tendency, Marusumi Paper has decided to proceed with a press rebuild project in order to improve productivity and end product quality. We chose Valmet for several reasons. The original supplier of the machine is Mitsubishi Heavy Industries, and Valmet has acquired the company’s paper machinery technology. We have also had good experience with Valmet in an earlier project. We are expecting great performance from Valmet also with this one,” says Tsuru Shimohara, Director and Mill Manager of Marusumi Paper.

New trim control solved runnability problems at APP Ningbo
Since installing Valmet TrimBox suction boxes on their paper machines 2 and 3 in July 2014, the APP Ningbo Mill has experienced no web breaks caused by trim problems. The trim suction box keeps the trim in contact with fabric with the help of vacuum, preventing it from continuing onto the press section with pick-up felt. Before the installation, the mill had several web breaks due to web stealing.

Other problems web stealing caused were poor runnability and lack of speed. All these were solved with TrimBox. Now the mill is able to run the desired web speed with no web breaks due to trim problems.

Valmet’s headbox technology awarded
Valmet won this year’s prestigious Paine d’Or Innovation Award with its OptiFlo headbox with Aqua layering technology. The award was given by the French Paper Industry Technical Association (ATIP) in connection with the ATIP Conference and Exhibition in Grenoble, France in November 2016.

Valmet’s OptiFlo headbox with innovative Aqua layering technology makes it possible to produce a two-layer sheet with very good layer coverage, using only one headbox and one former unit. A thin layer of water is used as a headbox wedge to separate different stocks fed into the headbox. Previously this separation has been done with mechanical elements like vanes and solid wedges.

MILL SÖDRA CELL’S MÖNSTERÅS PULP MILL
TWINROLL PRESS INSTALLED AT
A Twinroll Evolution press was successfully installed at Södra Cell’s Mönsterås pulp mill in Sweden in the end of September. This is the 85th Twinroll Evolution press Valmet has delivered since the model was launched in 2009.

“The new wash press will play an important role in our process to secure a grade of pulp that meets customer requirements and to achieve improved availability,” says Olle Hellström, one of Södra’s project managers.

Lars Harrysson, project leader at Södra, said that the installation and commissioning were highly successful, and that the schedule was maintained throughout the project. “Everything has worked out, and everyone has done their utmost to get the new press installed and running,” says Harrysson.

Grade conversion rebuild for Kruger Packaging
Valmet will modernise a paper machine (PM 10) at the Kruger paper mill in Trois-Rivières (Québec), Canada. Currently producing newsprint, PM 10 will be rebuilt to produce 360,000 tonnes per year of 100% recycled lightweight and high strength linerboard. The rebuilt production line will start up in 2017.

“Kruger selected Valmet based on its innovative technology and track record of successful rebuilds, as well as their knowledge of North American recycled linerboard requirements,” declared Project Manager, Christian Lemay of Kruger Packaging, L.P.
CUSTOMER’S VOICE
Moving forward together

Industrial Internet is a topic that is widely discussed today as something that will come in the future. However, Valmet has already today a strong infrastructure and technical expertise to serve its customers on a daily basis with the help of Industrial Internet.

Improved performance with Industrial Internet – already today
or Valmet, Industrial Internet means the ability to capture and share data and information from the pulp, paper and energy production machines and processes, and to utilize it for the benefit of our customers. Together with our customers we move their performance forward by utilizing the data to adjust operations and to plan preventive maintenance. We have already implemented hundreds of solutions utilizing our Industrial Internet capabilities.

“As an example, we have today over 400 online connections with over 70,000 I/O tags monitored. We have been offering advanced remote analysis services to our customers for a long time,” confirms Johan Pensar, Director of Digital Services and Analytics at Valmet. “The future is already there.”

**Long history in the digitalization of process industries**

Valmet’s background in Industrial Internet lies in 1960’s when the first automation solutions came to the market. In 1980’s, Valmet launched the first distributed controls and monitoring systems, and in the 1990’s was already able to embed intelligence and advanced information into the production processes.

“In early 2000, we started to provide our customers with 24/7 remote services for troubleshooting and for preventive maintenance. Already since 2010 our customers have been able to utilize our information services and remote analysis to increase their productivity, end product quality and raw material efficiency,” Pensar says.

Customers are extensively utilizing Valmet’s Industrial Internet capabilities.

Today, our customers can enjoy solutions that enable them to improve their performance by utilizing benchmark data and best practices regarding, for example, energy consumption optimization, fleet analytics and next generation process applications.

“Industrial Internet for Valmet means the ability to capture and share data and information from machines and processes, and to utilize it to adjust operations and plan predictive maintenance for the benefit of the customers.”

**Clear roadmap in Industrial Internet**

Today, enabled by advanced communication technology and big data analysis, Industrial Internet is already moving to the next level – outside the production facilities. We believe that in the future we will see networks of different systems impacting each other, connecting different value chains, and thus changing the whole society we live in, in ways that we can hardly envision today.

Valmet has a clear roadmap forward in Industrial Internet and intends to be a frontrunner in this field also in the future. The unique combination of intelligent process technologies, services and automation is a strong platform for further development projects that are currently ongoing.

In the coming few years, more advanced automation technologies and more diagnostics will be embedded into customers’ processes, keeping information security a high priority at the same time. Furthermore, mobile and remote services will be developed to the next level, ensuring the customers a fully mobile access to all information anytime and anywhere.

Valmet wants to be a game changer in utilizing Industrial Internet, bringing new opportunities to its customers.
Possibility to use more biomass fuels

Kuopion Energia Oy produces district heat for the residents of the city of Kuopio in Finland, thus the production reliability is in high priority. They have had Valmet’s FuelDiet KCL corrosion control system in use since 2013 at their Haapaniemi 3 power plant. The FuelDiet solution enables to use more biomass fuel without increasing the risk of superheater corrosion.

Jaani Silvennoinen, Valmet’s Product Manager for FuelDiet explains: “With the performance agreement and remote connection, we can give stability to the customer’s energy production process. As a result, they can now use 100% biomass and get real time measurement of the sulfur/chlorine ratio and hence react immediately if the ratio goes too low. Automatic control helps and guides the operator to run the power plant optimally and they have been able to increase the boiler’s maximum load.”

Virtual connection, remote diagnosis add to Burgo mill results

A Valmet bleach plant optimization project at Burgo’s Ardennes Kraft pulp mill in Belgium achieved the customer’s expectations and a good ROI. However, this was not the end of the task to maintain and improve the results. The control performance has actually improved under the watchful, remote surveillance of Valmet engineers. As an example, Valmet staff has diagnosed and corrected a temperature regulation problem. Valmet’s solution reduced the chemical consumption.

Through daily and monthly reporting and proactive follow-up, control solutions continue over the long term. A Performance Service Agreement includes remote system and process monitoring though a data link to Valmet which includes refined key process indicators (KPIs) and performance triggers. As a result, the Burgo process is virtually 24/7 in Valmet offices where the process performance is analyzed and diagnosed and recommendations can be made about how to correct a problem and improve the results of the controls. The bleaching process performance is monitored stage by stage and regular control performance reports are provided to the customer.

Eric Bazzoni, fiber line production manager, finds this a useful tool as it gives a concise report on key control objectives and uncovers any problems. Pierre Carnevali, projects manager, adds: “The reports tell us if we are in a good control range or not, and if we are consuming the right amount of chemicals.”

Industrial internet supports process improvement at CMPC Guaíba

In 2013, when Valmet and CMPC signed a contract to supply the main technology to Line 2 at CMPC’s Guaíba Mill in Brazil, the delivery included a major part of automation systems for the plant operations, such as Distributed control systems (DCS), Operation training simulator (OTS) and Advanced process control (APC). Embedded in this supply, Valmet delivery also included the possibility to remote access to operation data, allowing process improvement and system check-outs even when Valmet crew are not physical at the mill.

“Remote access to the DCS and mill data has always to be agreed with the client, due to security reasons, but it has shown to be a powerful tool to support customer operations whenever upset conditions take place. It allows us to provide fast support even during the night or when the problem can’t wait for a process engineer to travel to the site. It allows us also to analyze historical data to better understand the changes in process conditions along the time and find ways to further improve the plant”, says Dimas Rodrigues, Valmet’s process manager.

Technical assistant Rafael Santos (on the right) and process service engineer Filipe Centenaro of Valmet viewing the operation data together with CMPC’s machine crew.
By analyzing big data from a production line, it is possible to increase maintenance efficiency, improve availability and optimize maintenance costs. **TEXT**: Marjaana Lehtinen

Valmet has a strong background in digitalizing production processes. The first sensors were installed in Valmet paper and board machines in the late 1980s and in the 1990s we embedded intelligence into production processes. 24/7 remote services have been available since early 2000.

“The new thing is that technological advances in software and hardware now enable us to utilize all this embedded intelligence much better and provide our customers with value-adding solutions. These allow our customers to improve their performance by utilizing integrated data for better benchmarking, predictive models and best practices, for example, regarding energy consumption optimization, fleet analytics and next-generation process applications,” says Markku K. Salo, Manager, Sales and Operation Development, Valmet.

**Maintenance takes one step further**

For maintenance operations, using big data means evolution instead of revolution. Today, mill-wide maintenance data is collected into ERP and other systems, enabling big data analytics. Data can be shared and utilized between various systems, which brings major benefits for maintenance management, planning and operations.

The amount of data available for maintenance management is now significantly larger as it is possible to collect, combine and analyze data from several sources, such as a stand-alone condition monitoring system, an automation system, a computerized maintenance management system and a cost control application, just to name a few examples.

“By analyzing all this data, customers can, for example, see predictions for how their equipment will function in the near future and what its optimal service intervals are. This makes maintenance predictive and enables its optimization. On the whole, this improves production line or process availability, saves time and optimizes maintenance costs,” Salo explains.

**Development projects with consumables ongoing**

Valmet is currently carrying out development projects in which big data is employed to optimize the use of consumables in paper machines. One of the projects deals with roll surfaces. It combines roll grinding data from a stand-alone grinding machine with thousands of roll performance signals from a paper machine and with manufacturer information. By integrating all this data, it is possible to detect deviations and analyze roll condition in a totally new way.

“By better understanding roll performance and roll maintenance needs, it is possible to extend roll service intervals by 20% and thus extend roll run times. There is no longer a need to change a roll just to make sure that it will not break,” points out Hannu Lätti, Senior Paper Technology Manager, Valmet.

Through predictive modeling, Valmet can provide its customers with a weekly estimate on how long each roll can be run. “We have started big data analysis with consumables, such as calender and sizer rolls as well as wet end fabrics. There are plenty of other possibilities to utilize it, for example, in optimizing energy consumption,” adds Pekka Linnomaa, Director, Paper Technology, Valmet.

**Information for better decision making**

To work on the big data collected from various systems, Valmet has a logical data warehouse for advanced analytics and analysis tools.

“By analyzing and processing the huge data volumes, we produce information that enables our customers to make better maintenance decisions for their own processes,” Linnomaa concludes.

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**More intelligent maintenance with BIG DATA ANALYTICS**
The integration of a biomass gasifier with an existing coal-fired boiler has enabled Vaskiluodon Voima’s power plant in Vaasa, Finland to increase the use of renewable fuels. This has contributed to optimized costs and reduced emissions. The emissions are monitored with Valmet’s emission monitoring and reporting application.

The world’s largest biomass gasifier reduces emissions at Vaskiluodon Voima

The world’s largest biomass gasification plant started its commercial operation in early 2013. This is the first time ever that biomass gasification has been adopted to replace fossil fuels on such a large scale.

The target for the investment was to use more renewable fuels in production and to reduce coal consumption by 25–40%. Vaskiluodon Voima also wanted to be able to use multiple fuels and thus optimize fuel costs. Therefore, Vaskiluodon Voima decided to convert its existing high-efficiency production unit to use gasified biomass.

TEXT Marjaana Lehtinen

IN CHARGE
Operational Engineer Melina Kallio-Könö is in charge of environmental issues at the Vaskiluodon Voima plant.
“We strongly believe in biomass combustion. It represents the future.”

Gasifier integrated into the existing boiler

Valmet delivered the biomass gasification plant that was built as part of the existing coal-fired power plant and integrated with the pulverized coal boiler. The gasifier feeds the boiler with product gas that is combusted together with coal.

The 140 MW gasification plant delivery included a fuel yard, a large-scale belt dryer, a circulating fluidized bed (CFB) gasifier, modification and integration on the existing coal-fired boiler, and an extension to the Valmet DNA automation system with advanced applications. Having everything from one supplier ensured a perfect match of solutions.

Also fueled solely with product gas that is combusted together with coal, the gasifier has become a new fuel in our fuel range. “We have been very pleased with Valmet. It has been a proactive partner for us in developing cleaner combustion and now in increasing gasifier capacity,” Vaskiluodon Voima explains.

Local biomass utilized

The gasifier is fueled with forest residues, stumps and round wood. Peat is used as a backup fuel. The utilization of biomass that comes from a radius of 100 km around the plant has created new jobs in the area, and thus boosted the local economy.

As the moisture content and heat value in various bio-fuels vary a lot, more detailed information about them is needed. As each fuel load arrives, it is registered into the Valmet Fuel Data Manager application, which is integrated with the plant’s Valmet DNA automation platform that has automated and facilitated all tasks related to bio-fuels. Valmet DNA offers a real-time monitoring window to the control room and office.

Also fueled solely with product gas

“We have succeeded very well in reaching our targets, and the outcome has exceeded our expectations,” states Matti Loukonce, Plant Manager at Vaskiluodon Voima. “Most important – product gas has become a new fuel in our fuel range.”

Thanks to biomass gasification, the company now has the capability to replace about 25–50% of the coal with local biomass, depending on the boiler load. “We strongly believe in biomass combustion. It represents the future,” Loukonen adds.

Emissions significantly reduced

Another main target for the investment was to reduce emissions – and this has been achieved, too. Through biomass gasification, the plant has been able to lower its CO₂ emissions by approximately 230,000 tonnes per year. SO₂ emissions are also lower.

To monitor emissions, the plant uses the Valmet DNA emission monitoring tool. The application provides all necessary information for emission monitoring and reporting.

“Our future challenge lies with NOₓ emissions. We need to decide how to stay under the new EU limit values after the transition period. We are currently considering options such as a SCR (selective catalytic reduction) or SNCR (selective non-catalytic reduction) method – or perhaps another gasifier,” Loukonen says.

The cooperation between Vaskiluodon Voima and Valmet has been mutually fruitful. “We have a strong belief in biomass combustion. It represents the future,” Loukonen adds.

GASIFICATION INCREASES IN POPULARITY

Over the past few years, Valmet’s gasification technology has made a true breakthrough. In addition to Vaskiluodon Voima, the technology has been successfully applied to gasifying waste at Lahit Energy in Lahit, Finland. In 2012, the company started up the Kymijärvi II solid recovered fuel (SRF) gasification power plant as the first of its kind in the world. With the new 160 MW gasification plant, Lahit Energy has halved its need for coal by using SRF.

Valmet is currently supplying two biomass gasifiers for OKI Pulp & Paper Mills’ new pulp mill in South Sumatra, Indonesia. The commercial production at the mill is expected to begin in 2016.

 Metsä Fibre has chosen Valmet’s biomass gasification technology for its Bahaukandi biomass product mill in Indonesia. The gasification plant will dry bark and gasify it to product gas. The mill is scheduled to go on stream in 2017.

A biomass gasification plant has been ordered for the pulp mill project of Huanggang Chengxun Pulp & Paper Co., Ltd. in Hubei province, China. The new mill is expected to start up in 2017.

Quick and reliable reports whenever needed

“Today, we have used the solution for our in-house monitoring purposes. It has made our lives much easier and helped us minimize human errors. We no longer need to spend time collecting data from spreadsheets and transferring it from one place to another,” Melissa Kallio-Kinnunen, Operational Engineer at Vaskiluodon Voima explains.
The calculation package also includes the emission forecasts and the cumulative moving averages as support tools for effective power plant emission control. Additionally, continuous maintenance and expert support for the application as well as a wide range of reporting services are available through Valmet’s customer service agreement.

“The application provides us with follow-up trends and analyses of emissions for efficient in-house monitoring. It has also helped our R&D activities. We can now quickly go back to the history information and see, for example, why the limit values have been exceeded and what kind of fuel mixture was used at a particular time. Whatever our reporting need is, we quickly get a reliable report on it,” she says.

All process information on the same platform Vaskiluodon Voima has been using Valmet’s automation system to run its plant operations for a long time. The new Valmet DNA emission monitoring solution is a perfect fit with the existing automation platform as it is based on the Valmet DNA information system. Integration with the process control system brings a major benefit for the entire plant. It enables online and even proactive emission management through access to real-time emission data, cumulative values and emission forecasts.

“Having all the systems and solutions on the same platform enables seamless communication between them,” Kallo-Könö points out. “We have had good experience with Valmet in earlier projects. The company has been a reliable partner for us.”

Fulfilling EU requirements Valmet’s emission monitoring and reporting solution fulfills all the requirements of EU’s Industrial Emissions Directive and can be tailored to meet each plant’s specific needs.

“The solution features both real-time and long-term emission reporting as well as the follow-up of trends. It enables a quick reaction and efficient analyses of disturbance situations. In short, it saves time and makes the emission data more usable and reliable,” says Tiina Stenvik, Solution Manager, Performance & Sustainability Solutions, Valmet.

The results are reported in a clear format as browser reports, displays and automatic trends. The data can be further analyzed in MS Excel.

EASIER DATA MONITORING

“We no longer need to spend time collecting data from spreadsheets.”

VASKILUODON VOIMA IN A NUTSHELL

Vaskiluodon Voima Oy operates two combined heat and power (CHP) plants in western Finland, one in Vaasa and the other in Seinäjoki. The Vaasa power plant has a capacity of 230 MW of electricity and 175 MW of district heat. It runs a pulverized coal boiler with an integrated biomass-fired gasifier by Valmet.

Before the installation of the gasifier, the plant consumed from 320,000 to 600,000 tonnes of coal per year, of which about 25–50% can now be replaced with local biomass. For emission reporting, the plant utilizes emission monitoring and reporting tools supplied by Valmet.

“Easier data monitoring

“Our main goal for the investment was to be ready when the new Industrial Emissions directive is implemented. At that point, the authorities will require our monitoring data on a 48-hour basis instead of getting it on a monthly basis. This solution will make things easier for us,” says Operational Engineer Melina Kallio-Könö.

The calculation package also includes the emission forecasts and the cumulative moving averages as support tools for effective power plant emission control. Additionally, continuous maintenance and expert support for the application as well as a wide range of reporting services are available through Valmet’s customer service agreement.

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Savon Sellu board mill: ROLL SERVICE AGREEMENT INCREASES RELIABILITY

Close partnership with Valmet increased cost efficiency and roll availability. TEXT Mínea Hara

Savon Sellu’s board machine started running in 1968, and more than nine million tonnes of high-quality fluting board has since been dispatched all over the world from Kuopio, Finland. In order to improve the availability of rolls and lower costs, Savon Sellu signed a roll service agreement for the board machine with Valmet in 2011.

“Controlling the profile in the machine and cross-machine directions is important for us so that we can produce goods with uniform quality,” says Jussi Herranen, Maintenance Manager at Savon Sellu. “When we began having trouble with the large process rolls and saw an increase in the number of unplanned shutdowns, roll management became a focus area in maintenance. For this purpose, we got a fine partner – Valmet – to provide significant assistance and roll service training to support our own maintenance functions.”

Goal: stress-free roll service

When drafting the agreement, the main goals were defined in detail. “Our aim was to achieve long running times for rolls and to service and grind the rolls with minimal effort and a clear operating model,” Herranen says. “We also wanted to decrease the number of unexpected shutdowns due to rolls.”

In the end, the agreement included covering, grinding, roll service and service parts. The rubber roll covers in the press section were replaced with PressPolar polyurethane covers, which have excellent resistance to heat and wear. In addition, Valmet offered maintenance and operating training to the mill. “The plan was very clear, and it was drawn up in good cooperation,” Herranen says.

Virtual IDs were created for the rolls. Now the system directly shows which roll is being serviced.
Stora Enso takes lignin further

The lignin extracted from the pulp production process is a potential new product for the pulp and paper industry. Stora Enso sees lignin as an attractive business opportunity. TEXT: Andreas Liedberg

Stora Enso started its LignoBoost plant at the Sunila mill in 2015. The lignin is being used as fuel in the lime kilns, which has considerably lowered the CO2 emissions from the mill. Stora Enso has researched lignin and its attributes for more than a decade and lignin is seen as an attractive business opportunity.

In the future more and more pulp mills will become biorefineries that, in addition to pulp, produce other bio products, adding new sustainable business for the mills. One of the new products is lignin, which is removed from the wood fibers in the pulp mill’s cooking process. Lignin is normally burned in the recovery boiler but with Valmet’s LignoBoost it can be separated from the mill’s liquor cycle. It has been estimated that the total annual global production of lignin in the pulp and paper industry is more than 50 million tonnes. This means that lignin is a prime candidate as a raw material for a wide range of products that are today manufactured from fossil sources. For example, according to Pöyry Consulting’s “Bio insight up to 2025” report, the market for bio-based plastics is expected to grow by 1.36 million tonnes between 2013 and 2018.

Growth in bio-based products

Doubled running times

The results were already clear by the end of the first agreement period. Acute problems with suction rolls and press rolls were overcome and the situation had stabilized.

“The clearest result could be seen in the doubled running times of the roll covers in the third press. In addition, unplanned shutdowns caused by these rolls have been eliminated. This is important to us, as the availability of our equipment was the main goal of this agreement,” Herranen adds.

Virtual equipment IDs have also been created for the rolls by identifying and clearly marking them. Now the system directly shows which roll covers in the third press have been eliminated.

With the agreement, learning takes place at both ends, while the relevant competence at the mill is maintained. “There is a lot of know-how, and our service engineers have been very active. He makes proposals and presents the various options, and we make our decisions based on his input,” Herranen adds.

With the agreement, learning takes place at both ends, while the relevant competence at the mill is maintained. “There is a lot of know-how, and our service engineers have been very active. He makes proposals and presents the various options, and we make our decisions based on his input,” Herranen adds.

“The goals defined in the agreement have been achieved, and the cooperation has made roll maintenance and management easier,” Riiikonen adds.

Immediate results through condition monitoring

Savon Sellu aims to constantly improve its operations, with the goal of making the best fluting board in the world. The results it gained from working with Valmet were a major factor in the decision to extend the cooperation beyond the end of the first agreement period.

In addition, in early 2015, Savon Sellu ordered a condition monitoring software application from Valmet Automation. The software was initially deployed in June 2015, and it can currently continuously monitor 350 points in the board machine. “We hope to be able to further extend the functionality next year,” Herranen expects.

Stora Enso is a Finnish company

Stora Enso is a Finnish company that produces all grades of board and paper products as well as pulp. The company also manufactures and sells a variety of bio-based products, including lignin, a byproduct of the paper-making process. Stora Enso is one of the leading providers of bio-based products for the global market.

Savon Sellu in brief

Savon Sellu, based in Kuopio, Finland, produces semi-chemical fluting under the Powerflute brand. Its special requirements are a high level of hygiene and appropriate rigidity, as one of the applications of Powerflute is fruit and vegetable boxes, which are stacked on top of each other under varied transport conditions.

Production capacity: about 275,000 tonnes per year

Wire width: 6,700 mm

Speed: 700 m/min

Powerflute is fruit and vegetable boxes, which are stacked on top of each other under varied transport conditions. Its special requirements are a high level of hygiene and appropriate rigidity, as one of the applications of Powerflute is fruit and vegetable boxes.
The rolling handling equipment from reel to storage needed a major safety improvement. There were no straight lines when it came to the logistics of moving parent or customer rolls, rolls were lifted with cranes and then lowered again and moved back and forth.

Safer winder

In some cases, modernizing an existing winder is a worthwhile option. Depending on the winder’s age and condition, modernizing offers a number of improvement possibilities. In the case of Tainionkoski, the old winder was from the 1960s. A number of upgrades had already been done, but there was no reason to continue on this path because for one, the winder needed to be turned by 90 degrees, and the cost would have exceeded the benefits.

For Tainionkoski, a new winder turned out to be a more cost-effective option. Tommy Myller, Project Manager at Stora Enso Imatra Mills

Valmet’s delivery included an OptiWin Drum two-drum winder, transfer rails from reel to winder, and some measurements and controls for the board machine. The winder was equipped with many automated functions e.g. reel speed handling, a butt-joint splicer, tail threading devices, set change, core feeding with taping and end taping equipment. “The whole package is highly automated. The winder works well,” Myller continues.

Safety turns into profit

“The safety image of Valmet and how Valmet worked here was all good,” he continues.

Safety in focus

Safety is of high priority for Valmet. Equipment safety can also be divided into number of important sectors: mechanical safety, automation and process knowhow. Valmet has strong knowledge of all of these areas. Safety management, equipment safety and safety in projects and site operations must all be included in equipment modernization.

All Valmet-supplied safety related parts of the paper machinery must meet or exceed the performance requirements specified in the safety standards for paper machinery (EN 1034-1 to EN 1034-27). Valmet has a systematic validation tool to make sure that all components and equipment are safe. “We can trust the safety of Valmet’s equipment if you take care of equipment safety and make sure it’s quite safe to move around the mill, you’re OK. That covers just the icing on the safety cake. Safety is about how the site is planned and scheduled, how people work together in a mill or a project, whether the equipment is safe and the final product safe to use, what kind of protective clothing people wear – and it all ends up how people behave. “When it comes to safety, there were noticeable differences between different companies working in the project. Big companies stand out to their advantage. In some of the small companies, the safety culture is not yet at the same level. No news is good news, from the point of view of safety delegates,” states Väärä.

“The safety image of Valmet and how Valmet worked here was all good,” he continues.

SAFETY

Efficiency through living and breathing safety

Safety was one of the main targets in the TARU modernization project of Stora Enso’s Imatra Mills’ Tainionkoski board machine No. 5: the goal was to improve safety in all operations, from reel to storage. It takes time before a mill learns to live and breathe safety. Tainionkoski has come this far.

Text: Pauliina Purola
Photos: Pauliina Purola, Tommi Myller, Mikko Nikkinen
Bubbling fluidized bed boiler in Heinola:

\section*{OVER 30 YEARS IN SERVICE}

The 80s saw a high number of technological advances; one of them was the introduction of fluidized bed boiler technology. Valmet’s (Tampella at the time) first large boiler representing this innovative concept has continued producing process steam for boardmaking and heat for the district heat network of the city of Heinola for now well over 30 years.

Looking back over the past three decades and more, Jukka Louhimo, Product Manager, Valmet, remembers the case well. “I was a young product engineer at the time, and the Heinola boiler was one of the first deliveries in which I participated. Our BFB solution combined with a pulverized coal firing system had not been tested anywhere else earlier, so the case involved a lot of research and development.”

The 120 MW boiler plant was designed to run on milled peat, bark and sludge from the mill’s wastewater processes. To ensure full capacity, the boiler was equipped with pulverized coal fired load burners. “We recognized the furnace slagging risk that coal combustion presented for the bed. However, there have never been any slagging problems,” Louhimo adds.

In the following five years, the BFB boiler in Heinola was an important reference for the supplier. As one of the first large multi-fuel boilers based on BFB technology in the world, it aroused international interest. Louhimo recalls: “For example, a Spanish customer shipped eucalyptus bark for combustion tests, and the successful trials led to an order.”

In addition to the original fuels – milled peat, bark and sludge – the boiler is fueled today with forest residues. Coal and oil are used in the load burners during the peak loads in winter. Oil is used as the backup fuel in case of disruptions. The bed has a capacity of 85 MW.

Since its commissioning, the BFB boiler has been running for nearly 250,000 hours. “Its availability has been on a good level. As it is our main boiler, high availability is a must, and only one two-week service shutdown is allowed for it,” points out Eija Liikola, Development Manager, Energy Department, Stora Enso Heinola Fluting Mill. “We continuously check and monitor the boiler condition and carry out proactive maintenance work on it.” There is a three year agreement for boiler inspections between the plant and Valmet.

In 2006, Valmet upgraded the boiler’s automation system to Valmet DNA as well as supplied a safety interlocking system and a Valmet DNA LCP Emission Monitoring application. In 2007, Valmet delivered a flue gas scrubber and an electrostatic precipitator for the power plant. The investment resulted in low sulfur and dust emission levels. Valmet upgraded the fuel feeding system in 2012 and rebuilt three superheaters in 2015.

“Boiler availability is now even more important than earlier since the operating license of our backup boiler expired as of January 2016. If there is an unscheduled boiler shutdown, the whole fluting mill has to be shut down,” Liikola remarks.

Next: the NOx challenge

One of the challenges with all aging boilers is that they have not been designed for today’s tightening emission limit values.

“Our big challenge lies with NOx emissions. Valmet has carried out some studies, and it seems that a Selective Catalytic Reduction (SCR) system might be the only alternative for us,” Liikola continues. “We will make the final investment decision after the Best Available Techniques Reference Document has been finalized. As its limit values can be lower than those in the Industrial Emissions Directive, we don’t want to make investments twice.”

Commissioned in late 1984, a Valmet-delivered bubbling fluidized bed boiler (BFB) has been serving Stora Enso’s fluting mill in Heinola, Finland, for nearly 250,000 hours.

\textit{TEXT} Marijana Lehtinen

\section*{OVER 25 YEARS OF HYBEX BOILERS}

The bubbling fluidized bed boiler at Stora Enso Heinola was a predecessor to today’s HYBEX boilers and an important milestone in Valmet’s boiler development.

In 1995, the first version of the HYBEX boiler with the patented Hydro Beam floor evolved when the inclined grate at Stora Enso Anjala MB was converted into a fluidized bed construction.

These innovations led to a major boiler rebuild boom, first in Finland and Sweden, and later elsewhere in the world.
CMPC Riograndense Ltda’s Guaíba pulp mill in Brazil no longer emits any hazardous or malodorous gases into the environment. They are efficiently controlled and removed by Valmet’s non-condensible gas (NCG) treatment system – probably the most comprehensive one in the world.

TEXT Marjaana Lehtinen

BETWEEN 2013 AND 2015, CMPC expanded its Guaíba pulp mill located close to Porto Alegre in Rio Grande do Sul State, Brazil. Valmet supplied all the main technologies for a new 1.3 million tonne pulp production line, including solutions for treating concentrated non-condensible gases (CNCG) and diluted non-condensible gases (DNCG).

"Only by deploying a secure NCG system can we honor the promise of zero odors made to the environmental authorities and avoid complaints from the community," says Daniel Sidoruk, Recovery and Utilities Area Coordinator at CMPC Guaíba. "As Valmet supplied the digester, evaporation plant, recovery boiler and white liquor plant that emit NCG, it seemed very consistent to use the same technology provider to integrate such a complex NCG system."

Sidoruk lists Valmet’s strengths as being able to provide proven technology, compliance with contractual terms, excellent technical support in Brazil as well as the long, successful relationship with CMPC.

"Over 100 odor sources controlled by one system" Valmet’s integrated NCG system covers both pulp mill lines. This leaves no ‘grey area’ between them. The effect of every process decision on the whole system can be evaluated, and there is only one operating philosophy. In addition, having the same type of CNCG burner in both recovery boilers means fewer spare parts.

"Only by deploying a secure NCG system can we honor the promise of zero odors."

TOTALY ODORLESS
burner in the recovery boiler, while the back-up burner can be a burner in the lime kiln, a power boiler or a standby flare burner.

“At Guaíba, there are six combustion locations for CNCG to ensure that odorous gases will not be emitted into the atmosphere under any circumstances. When switching the CNCG from one burner to another, there is no venting of odorous gases. This is done by bottling up the CNCG in the piping while waiting for the back-up burner to be ready to receive the CNCG. Valmet’s automation solution plays a major role in controlling the system,” Smolander explains.

No emissions, high availability

The integrated NCG system at Guaíba is working very well. “It can be said that the system availability is practically 100%. There is always a system ready to handle NCG and prevent gases from being emitted into the atmosphere,” Sidoruk says.

Valmet carried out some system fine-tuning during the November 2015 outage to remove even the slightest chances of any NCG emissions escaping into the atmosphere. “We consider the project to be victorious, and it has brought environmental gains to our company. There was a lot of uncertainty about the proper functioning of this system due to its high degree of complexity, but now this has been debunked. We are sure that the solution implemented in November will suit our needs, and we will be a totally odorless mill. The system has met our expectations,” Daniel Sidoruk concludes.

FLEXIBLE OPERATION

The Dangjin Biomass Power Plant near Seoul in South Korea is the largest biomass power plant in Asia and started operations in August 2015. It uses a mix of agricultural and associated by-products. The plant generates 105 MW of electricity and the demanding process is run with Valmet’s latest automation technology – Valmet DNA distributed control system. TEXT: Soili Städers}

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The plant is fueled with a mix consisting of 80% palm kernel shells and 20% coal. With Valmet’s advanced automation applications, it is possible to control even these difficult fuel mixes with varying fuel ratios.

**Automation system covers the whole plant**

The Valmet DNA automation system is in use for the whole biopower plant, including the circulating fluidized bed boiler, balance of plant equipment, fuel handling system and electrical network. The plant has one main control room and another for the fuel field. JeongHo Ahn, Maintenance Manager, explains that the use of biomass is very important for the company and its sustainability progress. GS EPS has launched a broad energy management program where the greenhouse gas emission level assessment and measures to reduce emissions, for instance, play a key role.

**Flexible operation means a smooth process**

DNA Operate is the operator interface of the automation system and is executed in the operator stations. DNA Operate is used for all operations and monitoring, including graphical process control displays, event and alarm displays, loop windows and interlocking windows, among others. The main control room is run by five operators who work daily with Valmet DNA. Initially, the technical descriptions in the user interface were used regularly. Now that the operators have learned the features of the automation technology, they are no longer used so frequently – but they are certainly useful for training new operators.

**User-friendly tool for operators**

“The more user-friendly the automation system, the better the operators can utilize it. For me, it is most important that the heavy users – the operators – can make good use of the automation system. The initial training from Valmet’s experts was a good start to learning the process. Then you can learn more by doing,” states JeongHo Ahn.

First thing every morning, JeongHo Ahn checks what happened during the night shift. For him, it is important to analyze the alarms to further develop the process.

**Information is power**

Information from Valmet’s monitoring and reporting applications is regularly used by the management. Many parameters can be followed, such as the fuel data and performance of the power plant and steam turbine. Real-time reporting is based on concrete measurements. Valmet’s heat exchanger performance monitoring provides the plant’s maintenance personnel with a powerful tool for detecting problems and deviations in the heat balance. Furthermore, the thermal stress monitoring lets the personnel follow the heat situation, which contributes to the economical operation of the boiler. In power generation, as in many other industries, correct information at the right time clearly contributes to the success of the business.

**A biomass plant with attitude**

Now the automation project is completed successfully and JeongHo Ahn remembers the project phases with satisfaction. The planning phase was completed professionally, the installation and start-up were executed ahead of schedule. Throughout the project, information was shared openly between the customer and Valmet.

Now that Asia’s largest biomass power plant is fully in operation the plant management can be proud of its achievement.
Soon after Estonian Cell’s BCTMP mill in Kunda, Estonia, started producing mechanical pulp in 2006, the local energy market was deregulated, causing electricity prices and its distribution costs to rise to a very high level by 2012.

Lauri Raid, Chief Technology Officer of Estonian Cell, explains: “In mechanical pulping, it is crucial to keep electricity costs under control. Our challenge was to maintain the same high quality level, or even to improve it, and see how much energy we could actually save.

In 2012, Estonian Cell, a high-yield mechanical pulp producer—and Estonia’s largest consumer of energy—faced a pressing need for additional energy savings in their primary refiner. A profitable solution was found through refiner segment cooperation with Valmet. As a result, Estonian Cell is saving 5 GWh of energy annually.

The previous supplier’s refiner had to operate with a very narrow gap that keeps the shives and pulp quality at an optimal level. Accurate measurements of the disc gap were needed in order to maintain this precise gap.

Petteri Vuorio, Technology Manager for Valmet Refiner Segments, worked as one of Valmet’s contact persons during the project. “When we started, the mill was already very energy efficient, so further optimizing the refining process was challenging.”

After positive references and extensive research, the mill signed a ProGap refiner segment optimization agreement in 2012. ProGap combines accurate disc-gap control with Valmet energy-saving segments. The agreement included a new AGS (Adjustable Gap Sensor) to accurately measure the disc gap.

The main results in electricity savings come from the optimized refiner segments together with accurate disc-gap measurements. Estonian Cell is saving more than 5 GWh annually with the refiner segment optimization agreement.
"Improving the primary refiner’s energy consumption by 5% makes a huge difference."

Samolberg. “Valmet sees the measurements online and we don’t have to print out the results.”

A contract for return segments was also included as an additional service. Valmet recycles the used segments and they are put to good use. This also supports Estonian Cell’s environmental goals.

Flexible cooperation

Estonian Cell describes Valmet’s service as transparent and customized. “There has been no difference whether it’s a working day or the weekend, or even at night – we always get the same rapid service,” says Raid. “Petteri understands the problem after just a few words,” Samolberg agrees. Estonian Cell has no plans to remain in its comfort zone. Discussions are ongoing to optimize refiner segment deliveries and minimize warehouse inventory at the mill. “For now, there’s no need to rethink our refiner segment supplier,” Raid concludes.

In 2014, Hansol Daejeon rebuilt its PM 31 board machine with OptiDry Coat air drying technology. Thanks to the excellent results, Hansol decided to perform a similar upgrade on its PM 32 board machine in 2015. Removing the old infrared dryers resulted in energy savings of up to 45%.

COMPROMISES

Energy savings without compromises

In 2014, Hansol Daejeon rebuilt its PM 31 board machine with OptiDry Coat air drying technology. Thanks to the excellent results, Hansol decided to perform a similar upgrade on its PM 32 board machine in 2015. Removing the old infrared dryers resulted in energy savings of up to 45%.

Hansol originally used steam in coating drying. With the price of steam rising, Hansol started to consider saving energy and costs by moving from steam to gas in coating drying. Hansol’s good experience of gas-operated air dryers delivered by Valmet in 2008 for the back coating stations of both machines helped the mill to make the decision to go from steam to gas on PM 31 in 2014. The excellent results from the PM 31 project convinced Hansol to do the same on PM 32 in 2015. In this case, Hansol also decided to remove the infrared dryers, which were very energy-intensive and required a lot of maintenance. Removing the old infrared dryers resulted in energy savings of up to 45%. After the project, the coating drying was completely carried out with OptiDry Coat air drying technology.
Smooth project led to fast start-up
Preparations for both projects went very well. The delivery times were tight, so everything had to be checked and agreed at the early stages of the project. For PM 31, all the challenges were quickly solved thanks to very good cooperation between the Hansol and Valmet project teams. For the PM 32 order, the same teams were involved on both sides, and all the lessons learned from PM 31 case were utilized.
Both projects started up on time. For PM 32, the testing time needed was even shorter as the people at the mill were already familiar with the procedures. Immediately after start-up, both machines produced sellable material with good quality.
“The PM 32 order was an easy decision for Hansol. Valmet had performed very well and even exceeded the performance targets for the PM 31 delivery,” says Byung Hak Choi, Production Manager at Hansol’s mill.

Easy to operate and maintain
The equipment is very easy to operate. The new dryers are quieter than earlier infrared dryers and steam-heated air dryers, so noise at the coating station has dropped. Valmet utilized a local burner supplier for both projects to ensure that all local safety regulations were taken care of and all necessary documentation prepared for license approvals. Koo Jun Yoo, Project Manager for the PM 32 project, states: “Maintenance has become a lot easier since the infrared dryers were removed. Also, the old air dryers with integrated steam coths often leaked. The new equipment has not needed any maintenance so far. The quality of the equipment has been very reliable.”

Valmet’s knowhow convinced Hansol
Hansol has a strong belief in Valmet’s knowhow. The decision to remove the infrared dryers from PM 32 was not an easy one, but Valmet convinced the mill with the good results of the PM 31 project, showing that excellent, even superior, quality is possible without infrared dryers. Valmet’s technology support was very strong in responding to all the customer’s concerns before the projects. One of the key reasons for the PM 32 order was the strong support that Hansol had received during the PM 31 project.

Huge energy savings of up to 45%
All targets of the projects have been met and excelled. For PM 32, the energy saving target was 30%, but currently 45% savings have been achieved. For PM 32, removing the infrared dryers has also improved safety and reduced the maintenance and cleaning time at the stations. The board quality is at least as good as before, and some improvements can even be seen; printability is good and visual appearance has improved. Furthermore, runnability has improved and the “folding” effect reduced. Hansol is happy with the results.

Chang Hoon Lee, Hansol’s Mill Manager, says: “Hansol is very happy with the energy and steam savings at the mill thanks to these two projects. The total energy cost for the mill has been about 55 million euros a year, and coating drying has been about 15% of the total cost. These projects mean we have been able to lower the number by up to 3%. Our long-term target is that the energy cost would be around 10% of the total cost structure. Our customers’ response has also been positive, and there have been no complaints about dust or motting problems.”

Production Manager Byung Hak Choi, who worked as project coordinator for both rebuilds, finds Finnish people very much like Korean people: very friendly and easy to work with. He believes that a good partnership and friendship was created. “It did not feel like supplier and purchaser, more like friends.”

All targets have been met and excelled. For PM 32 the energy saving target was 30% but currently 45% savings have been achieved.
SCA Obbola manages complete liquor recovery – FROM SMELT TO WHITE LIQUOR

The implementation of Valmet Recovery Liquor Analyzer, named Valmet Alkali R, was a key factor in the successful start-up of a new causticizing line at SCA Obbola pulp mill in Sweden. The new analyzer completes the required chain of measurements of the causticizing process and gives operators the tools they need to stabilize and optimize the entire process from the recovery boiler onward. “The start-up was one of the best I have ever experienced,” says Thure Sandström, Manager of the Recovery Area. He continues, “We installed the sampling and analyzing equipment during a production shut-down. We got reliable measurement data from the very first day.”

“With the new system we have learned more about how the recovery process, and in particular how the recovery boiler performs,” Peter Olsson, Recovery Boiler Manager, adds. “Now we have a reliable tool for better process control and process understanding. We see a number of opportunities to optimize the recovery process as focus can be put on the recovery boiler and its performance.”

So what are the new features of the Valmet Alkali R? To manage the entire chemical conversion process the first measurement point has been moved as far back as possible to the smelt dissolving tank where the reduction degree from the recovery boiler is measured. This is accomplished by a new titration module that measures sodium sulfate, complementing the previous capability to measure various alkalinity, sulfidity and causticizing efficiency parameters in the rest of the line. As well as providing information for recovery boiler reduction management, this measurement also allows the precise control of dissolving tank green liquor density and TTA.

Valmet Alkali R analyzers were first tested in two kraft mills in Finland where they have now been taken into regular production use. The first full-production unit was purchased by SCA Obbola where it has been performing well from day one, helping the mill to optimize the operation of a new causticizing plant since the start-up in November, 2013.

ROI potential
What extra capability for control and process optimization does this give operators and mill engineers? Antti Kokkonen, Valmet’s Product Manager for Valmet Alkali R, responds: “A higher reduction degree means that less white liquor is needed to achieve the required alkali charge to the digester. Also, the amount of dead load accumulation in the recovery process can be decreased by improved reduction efficiency and this will improve energy and loading performance of the process equipment. This also enables higher energy production in the recovery boiler. In addition, there is lower lime demand at a given production rate, and with higher sodium sulfide content the theoretical maximum causticizing efficiency...
The start-up was one of the best I have ever experienced. We installed the sampling and analyzing equipment during a production shut down. We got reliable measurement data from the very first day.

Stable analysis with improved safety

While the other mills used the analyzer to improve the existing processes, the Obbola mill had it its own reasoning relating to improving safety. "We were looking for a supplier who could meet the three criteria that were important to us, " says Per Malmros. It was certain we knew what they were doing," says Sofia Forslund, manager at the Obbola mill. As we were investing in a completely new causticizing plant we wanted to have a modern system improving work safety, as there are always safety issues in manual sampling, and more frequent process data to support the process operators. An important parameter was to have frequent data on the reduction degree. Earlier the sampling frequency of 6 to 8 hours was not good enough as we needed reliable information quicker, down to a level of every hour, or every second hour, on the recovery boiler performance. This called for an automated online solution. In addition to improved safety, SCA also received a measurement system that would improve the repeatability of the measurements for better control. "We could immediately see that the stability of the analysis results improved as we got rid of the variations due to different ways of manually taking the samples," Project Leader Kristina Jonsson says.

Exceeded goals

Has the mill achieved their goals with this investment? Thure Sandström responds positively: "We have not only achieved the goals, but also exceeded them. In all fairness, this is due to the automatic analyzing system and the new causticizing plant. The whole white liquor production is more automated nowadays and its progress is frequently followed by the system in real time. Hence we have a better control of what is happening." The article was published previously in the February 2015 issue of Pulp & Paper International Magazine.

WaterJet turn-up system

Stora Enso Hylte in Sweden installed a Valmet WaterJet turn-up system, with the result that paper machine PM 4 runs more reliably and with less downtime. The production volumes increased and as a further bonus, occupational health and safety improved. Text Sofia Forslund

Stora Enso Hylte is located in Hyltebruk in the south of Sweden. The mill produces paper for morning and evening newspapers in northern Europe. PM 4 produces about 25 tonnes of paper per hour with a basis weight range of 42–48 grams at a speed of 1,480 meters per minute. The machine was originally equipped with a Gosseneck turn-up system from 1989.

In recent years, the turn-up efficiency of the conventional pope reel had been deteriorating, leading to more downtime for PM 4. In 2013, PM 4 recorded no fewer than 861 failures due to poor turn-up efficiency. On average, this meant two failures per day, each of which took three to five minutes to rectify. Armed with this information, Hylte now had an idea for the future of PM 4: What improving the efficiency of the turn-up system would do for PM 4’s production volume? They set up a project group including supervisors Jan-Erik Karlsson, maintenance engineer Magnus Hallberg, machine operators Joel Haglund and Mikael Mildbeck, and project engineer Per Malmros.

"We were looking for a supplier who could meet the three criteria that were important to us," says Per Malmros. It was important that the new equipment would ensure a successful turn-up every time and had high availability and a short delivery time. Early on, the project group discovered that Valmet met all three criteria.

Installation during a planned weekly stop

In July, the contract between Hylte and Valmet was signed. At the end of October, the project group travelled to Finland to carry out a factory acceptance test. The WaterJet turn-up system was installed during a planned weekly stop at the end of November. Before the planned stop, Hylte and Valmet worked intensively together to prepare for the installation. The electrics and water system were in place so that when the stop occurred, the team simply had to assemble the beam and start up the system. The fine-tuning of the system went without hiccups, and six hours after the beam was put in place, PM 4 was up and running as planned. "Valmet’s capacity and competence were invaluable both before and during the installation. Valmet’s assembly manager Timo Martinsen and the fitters certainly knew what they were doing," says Per Malmros.

Better reliability and faster turn-up

Hylte chose to scrap their old turn-up equipment. The new WaterJet turn-up system offers better reliability and turn-up is carried out faster, more reliably and with more control than before. "These days, the machine rarely fails due to unsuccessful turn-ups. Occupational health and safety has also improved, as we don’t need to clean the machine before tail threading following disruptions. With Valmet’s WaterJet turn-up system, we saw immediate improvement in paper machine reliability, which has led to increased production volumes. The effect of the new WaterJet turn-up system has exceeded our expectations," Per Malmros ends.
Raw material is the single biggest cost in papermaking. The challenge today is to find solutions to optimize raw material efficiency and reduce consumption by keeping or improving board quality.

“We wanted to increase the competitiveness of finished products produced by our BM 1 and BM 2 machines,” explains Alexander Tufanov, Technical Director of board production development, about the factors behind the investment. “Our old refining system with several disc refiners had limited capacity and provided poor quality, and it was well worth looking for more modern solutions,” he continues. “Valmet’s solution was inviting because of Valmet’s proven track record in energy efficiency. We also felt that new refiners would give us better control over the refining process and improve the quality of the final product. The innovative refining principle was a factor as well,” Tufanov explains.

Increased production flexibility

During the upgrade of the stock preparation system, BM 1 – which produces kraftliner at a maximum speed of 730 m/min – got four OptiFiner Pro refiners for refining unbleached softwood kraft pulp. BM 2 produces fluting and uniliner at a maximum speed of 550 m/min, and it got four OptiFiner Pro refiners for refining both softwood and also a mixture of soft- and hardwood as well as new slot screening equipment for base ply stock. “Basically, the stock preparation process for BM 1 and BM 2 has not changed. The control of the rebuild refining process is now more flexible with quicker response, though. Visualizing the process allows equipment operation and the process to be more easily monitored. The time it takes to change the grades (between kraftliner and fluting) has been considerably reduced, which is extremely important for BM 2,” says Tufanov. The capacity of the refining system has also increased significantly.

Raw material savings

The achieved refining results of the physical and mechanical properties of the finished product are promising. The main strength parameters, such as burst strength and compression strength, are showing increases. “This has provided us as an opportunity to carry out tests with a higher proportion of semi-cellulose in the kraftliner and fluting furnish and reach good quality values for end product with lower cost furnish,” Tufanov explains. Tufanov also mentions that the opportunity to change the refining degree range without damaging the fiber has considerably increased since the installation of the new refiners.

Up to 20% energy savings

Dmitriy Hrapach, Board Production Director, explains the importance of further cost savings in the form of less refining energy, as their aim is sustainable and efficient production. “The new equipment met all our expectations. We achieved the target values for both energy efficiency and the quality of furnish components. The reduced power consumption in refining is considerable. For BM 1, we have witnessed energy savings of more than 5%, and BM 2 has been even better, with savings of about 20%,” he says.

“The stock preparation system rebuild for BM 1 and BM 2 is part of our board production development project,” Hrapach explains. “The results we’ve achieved are clearly visible in our current operations, as we have managed to improve our end product quality; reduce the costs of furnish components and save energy. The rebuild and the increased refining capacity are also a good starting point for further rebuilds of BM 1 and BM 2 as we continue to increase our production capabilities,” he says.

JSC Arkhangelsk PPM, the biggest containerboard manufacturer in Russia, has recently invested significantly in increasing the mill’s capacity, product quality, cost efficiency and sustainability. Valmet’s OptiFiner Pro refiners helped the Novodvinsk mill to meet its targets. TEXT Kaisamaija Marttila

“Optifiner Pro is up to date, compact and energy-saving,” says Dmitriy Hrapach, Board Production Director. CONTACT PERSON: Aleksandr Akishin, Capital Sales Support Engineer, tel. +7 921 768 6343.
In 2013, Fortum commissioned the world’s first industrial-scale, bio-oil plant integrated with a combined heat and power (CHP) plant. The targets of the investment were to increase total efficiency and the value of the existing CHP plant, as well as to open the possibility to explore interesting new business opportunities. The new plant has an annual capacity of 50,000 tonnes of bio-oil from wood-based fuels. The use of bio-oil has a significant positive environmental impact because energy produced with it can reduce greenhouse emissions by up to 90% compared with fossil fuels.

The bio-oil plant was supplied by Valmet as a turnkey delivery, including the foundations and buildings, feedstock reception and pre-treatment, pyrolysis system, bio-oil storage tanks, loading equipment, automation and electrification. The delivery also included installation, testing and training.

**Quality according to specifications**

In Joensuu, bio-oil is produced mainly from wood chips using fast pyrolysis technology. Constructed in connection with a fluidized bed, the solution features a reactor where the wood is vaporized. In fast pyrolysis, wood is decomposed in an oxygen-free atmosphere at high temperatures. The resulting vapors are condensed and the end product, bio-oil, looks and smells like tar.

“The process performs well: we have reached the planned production capacity, and the bio-oil quality fulfills specifications,” says Timo Partanen, Power Plant Manager, Fortum Joensuu. “The introduction of a totally new technology always calls for further development, but it already looks like we will reach the targets set for the investment.”

**Bio-oil proven suitable also for large power plants**

Bio-oil can be used as a replacement for heavy and light fuel oil at heat plants or in the production of industrial steam. Fortum’s bio-oil has been successfully used at Savon Voima’s heat plant in Isalam and at the company’s own heat plants in Joensuu and Espoo, Finland.

In 2015, Fortum exported its first batch of 160 tonnes of bio-oil for test combustion at E.ON’s Karlshamn power plant in Sweden. As one of the biggest peak-load and reserve power plants in the Nordic countries, this plant wanted to decrease its environmental load and get further assurance that biofuel can replace some of the heavy fuel oil in the future. In the successful test combustion, bio-oil was incinerated at a record output of 175 megawatts.

“Both small and large plants have now been run with bio-oil, and experience has shown that it works well in energy production. Our bio-oil has aroused a lot of interest, and we have ongoing negotiations with other customers,” Partanen continues.

**Process and product development continues**

Currently Fortum and Valmet are further developing and optimizing the process as well as testing other feedstocks, such as forest residues and sawdust. The target is to maximize fuel flexibility, while maintaining the required quality parameters, such as heating value.

“In optimizing the process, Valmet’s in-line analyzers continuously monitor both feedstock and oil moisture, and our specially developed laboratory equipment is used for other bio-oil-specific measurements. The control applications in the Valmet DNA automation system play a key role in the optimization work,” says Joakim Autio, Product Manager, Pyrolysis, Valmet.

In the future, bio-oil may become a valuable raw material for various biochemicals or traffic fuels. To promote this development, Fortum and Valmet have joined forces in the LignoCat project, which develops catalytic pyrolysis technology to produce high-value biofuels that replace fossil transportation fuels and to create new business for the consortium companies.

**Important milestone**

The world’s first integrated commercial-scale bio-oil plant in Joensuu is an important milestone and an excellent reference for Valmet. “We are in the process of commercializing the new technology and are ready for the next deliveries. The market has shown interest both in the pyrolysis process and in bio-oil,” Autio adds.
The new tighter nitrogen oxide (NOx) emission limits set by the Industrial Emissions Directive presented a challenge for Helen, a company fully owned by the City of Helsinki. To reduce NOx emissions even further, the company chose Valmet’s SCR system for its Salmisaari power plant.

“Through a public tender, we asked for earlier references from the possible suppliers and their response to various criteria for the equipment. Based on fulfilling our technical and other key criteria as well as the operating costs and price, Valmet ranked highest among the bidders,” says Reima Rynö, Project Manager at Helen.

Rynö appreciates the good cooperation with Valmet that actually started already during Helen’s pre-study phase and well before the call for tenders. “We asked several equipment suppliers about the NOx reduction methods they may be able to provide. Valmet was very active in answering our questions, which gave us a very positive image of the company.”

Ammonia produced by hydrolysis onsite
Valmet’s SCR solution is an effective NOx reduction method in which nitrogen oxides are reduced to harmless components, water and molecular nitrogen. This takes place in a SCR reactor by using a reduction agent and catalyst. The purpose of the catalyst is to speed up the reaction. The benefits of this method include maximized reduction efficiency – over 90% reduction of NOx – with minimum operating costs.

Typically, catalytic methods for removing nitrogen oxides employ ammonia as a reduction agent, but at Salmisaari B, the Helen Ltd has reduced the already low NOx emissions from its Salmisaari B power plant in Helsinki, Finland, with Valmet’s efficient Selective Catalytic Reduction (SCR) system that employs urea instead of ammonia. - Text Marjana Lehtinen

Maximized reduction efficiency – over 90% reduction of NOx – with minimum operating costs.
ammonia has been replaced by urea for safety reasons. "Our power plant is located in downtown Helsinki. According to the authorities' restrictions, we were not allowed to store large amounts of ammonia water onsite or have ammonia transported within the city area," Rynö explains.

With Valmet’s solution, urea water is converted into ammonia gas using hydrolysis equipment.

**A successful retrofit**

At Salmisaari B, the SCR system was installed in a pulverized coal fired boiler. In addition to the equipment, Valmet’s turnkey delivery included engineering, project management, procurement, steel structures, installation and start-up. Helen took care of the foundations and buildings required for the equipment. The new system was integrated into the plant-wide Valmet DNA automation system that Valmet recently upgraded.

Before the new system installation, Salmisaari B’s annual NOx emission average was slightly under 500 mg/Nm3 with 6% oxygen. Now the emissions have been about 50 mg/Nm3.

**Four SCR systems on their way to Poland**

During the past 20 years, Valmet has supplied SCR systems to numerous new and retrofit boilers. One of the latest orders includes SCR technology for four OP-110 coal-fired boilers at CIECH Soda Polska S.A’s CHP plant in Inowroclaw, Poland. The first of the installations will be operational in June 2016. The delivery also includes a wet limestone flue gas desulphurization solution.

In January 2015, Valmet’s first mechanical steam separator for fiberboard production, PeriVapor, was installed at BHW Beeskow Holzwerksstoffe GmbH, Germany. PeriVapor is specially designed for positioning in the blow line after the Defibrator.

**BHW Beeskow saves energy in fiberboard production with Valmet’s mechanical steam separator**

Valmet has extensive experience of mechanical steam separators used in the mechanical pulping process. This experience played a key role during constructing the new mechanical steam separator at BHW Beeskow.

**What is a mechanical steam separator?**

During the defibration process in fiberboard production, a large amount of steam is generated from the moisture present in the chips when they are broken down and the fibers exposed. The mechanical steam separator can divert up to 50% of the generated steam from the fiber flow for recycling in the pre-steaming bin. This steam replaces a corresponding amount of fresh steam making great savings possible.

**Great savings in energy**

At BHW Beeskow, the PeriVapor mechanical steam separator recycles 4-5 tonnes (about 6 bar) steam per hour. The mill has its own facility for producing steam for a turbine for production of electricity. The reduced amount of steam the pre-steaming bin requires is now passed to the steam turbine. Today about 1-4 MW/h more electricity is produced in the steam turbine. This electricity can be sold to the grid as green electricity at a favorable price.

**Optimization continues**

After the installation of PeriVapor, the mill’s emission levels, quality of the final product and resin consumption have remained unchanged. It is too early to be able to evaluate the positive effects on production because the mill is still in the running-in phase. Time will tell if other benefits can be achieved. However, one benefit that can immediately be seen is the inlet temperature in the dryer. It has been reduced by 5-8 degrees centigrade. If the dryer is a bottle-neck, this temperature drop gives a possibility for an increase in the production.

"The machine has been in operation during the hot summer months when the need for steam/heat is significantly lower than during the winter. It will be interesting to continue optimizing the process during the cold period to see how our PeriVapor performs then," says Imre Wittmaier, Production Manager of BHW Beeskow.
Today, Valmet's infrared technology can measure oven-dry basis weight (fiber weight) with the same degree of precision, while simultaneously measuring moisture. By combining both measurements in one sensor, Valmet IQ Fiber considerably reduces the lifecycle costs of servicing and spare parts and eliminates the need for nuclear safety training and handling procedures. The accurate scan averages and high-resolution CD profiles measured by IQ Fiber today provide a solid foundation for machine- and cross-direction oven-dry weight controls on over 140 tissue machines, using virgin pulp up to 100% recycled furnish.

**Upgrades on TM 1**

The QCS on Žilina’s TM 1 was upgraded in 2013, as the old basis weight and moisture sensors were nearing obsolescence and the results were gradually deteriorating as the basis weight nuclear source approached the end of its life. In addition to replacing part of the control hardware, the TM 1 scanner was upgraded to allow the installation of the IQ Fiber measurement system. As with any new technology like IQ Fiber, comparisons with earlier methods are of great interest. According to Stefan Mataki, Automation System Engineer at Žilina, the new measurement is more stable than the old nuclear sensor and moisture measurement. “The repeatability is better than before, and the sensitivity to head geometry and dirt is less critical,” he says. “As in all tissue mills, we have a lot of fiber particles in the air, but cleaning once per day is the only maintenance we’ve needed in over a year of operation.”

**Attention to PM2**

With good results from TM 1, which produces white tissue grades, the mill’s attention turned to TM 2 and colored tissue. Samples were sent to Valmet’s Tampere R&D facility to evaluate the effect of color and ash content on the measurement. The Žilina mill produces tissue from either 100% virgin fiber with about 0.5% ash, or from totally recycled furnish with about 3% ash, depending on tissue grade.

As Valmet’s Marko Toskala expected, the results confirmed that IQ Fiber would work well on TM 2 despite the different colored tissue grades and varying ash content. “Different colors are handled well by the measurement principle, only very dark black needs to be tested with paper samples beforehand,” he concludes.

**Good results on colored grades**

The TM 2 upgrade took place in June 2014, and according to Stefan Mataki, the results have been good with no problems. “The new sensor is a very good replacement for the old nuclear sensor. It gives the same or even better measurement quality for both basis weight and moisture.”

For Dusan Planeta, Production Manager, the change to IQ Fiber has been painless, with the results on colored tissue as good as white. “We have had very good results with the new measurements. One very big advantage is that there is no need for a radioactive source anymore. The new sensors are easier to maintain and all the annual nuclear safety procedures and costs can be dispensed with none.”

**Nuclear sensor replacement**

Nuclear basis weight sensors using radioactive sources have for many years been the standard for scanning the tissue web. They are capable of very precise, repeatable readings, but over time, noise in the measurement signal requires additional filtering as the radioactive source decays. To provide an oven-dry basis weight reading for control purposes, infrared moisture sensors are normally positioned alongside the nuclear sensor.

Metsä Tissue says **GOODBYE**

to nuclear sensors thanks to Valmet IQ

The recent upgrade of the quality control system on tissue machine 1 at Metsä Tissue’s Zilina mill in Slovakia was successful. The good results have led to the installation of a second Valmet IQ Fiber measurement system on the mill’s tissue machine 2, producing colored tissue. – Text Nigel Farrand

Metsä Tissue is part of Metsä Group. The Zilina mill is one of the company’s European tissue sites. With its high-quality tissue and cooking papers, Metsä Tissue is a leading supplier of tissue paper products to households and industrial consumers in Europe, and also the world’s leading supplier of baking and cooking papers. With production units in six countries, Metsä Tissue employs a total of about 2,800 people.
INNOVATOR’S VOICE
Get inspired

Maximum equipment performance through MODULAR SERVICE SOLUTIONS

Valmet’s modular service solutions offer pulp and papermakers clearer choices for the maintenance of rolls and equipment for fiber production. This helps the customer to make wise maintenance choices, for efficiency and maximum performance.

TEXT: Stefanie Radecki, Ari Koivula
Valmet serves over 2,000 mills and plants worldwide from over 100 service locations. We want to serve our pulp and paper customers efficiently and transparently which has led to modularizing our maintenance services for rolls and equipment for fiber production.

Reaching improved performance together

Pulp and paper makers are constantly aiming at improving productivity, and for that reason the focus of the modular services is on maximizing performance. The customer can be actively involved in decision making and the choices have been made easy and clear. Valmet can provide specific, for-you expert recommendations of optimal service solutions. Arne Wessbladh, Director of Workshop Services explains that Valmet experts will “work with the customer to find out what real issues they are facing and help find applicable solutions and answers to these specific needs.” In this way, the customer can make an informed choice of what options suit their immediate and future needs the best. Additionally, upgrades and modernizations can also be suggested and where there can be room for improvements in availability or performance.

Valmet's technology and global expertise can complement the customers in their operations. The aim is that the customer gets the best out of Valmet as the partner. The customers do not have to worry about paying for unnecessary activities.

Modular service solutions

The modular maintenance of rolls and equipment for fiber production is divided into three modules. The MaintAce maintenance services include the basic services activities for keeping operations up and running. The ReconAce reconditioning services will bring equipment back to as-new levels. RunAce upgrade services bring additional benefits through tailored modernizations. The modular approach means that the customer knows what to expect from each service solution. This also ensures purposeful service actions and best possible use of assets. The customer can ensure the best availability and safety and save on maintenance costs.

Moreover, through RunAce upgrades and value-adding repairs, benefits can be seen through extended running time, better energy efficiency and runnability, and improved end product quality.

Uniform quality all over the globe

A globally uniform high quality is the core of Valmet's service operations. This is achieved through agreed standards and practices all around the world.

Timo Karonen, Global Technology Manager for Roll Maintenance Services, explains how the customers will benefit from modular service solutions: “The modularity clarifies service-related communication between the customer and Valmet and minimizes the chances of any misunderstandings. It also streamlines maintenance lead time, makes our services more flexible and lets us meet each customer's service needs in the optimum way.”

Modularity streamlines maintenance lead time, makes our services more flexible and lets us meet each customer’s service needs in the optimum way.

Modular services for maintenance of rolls and equipment for fiber production

RunAce upgrade services – Upgraded performance

Offering updates on existing products with modern features, based on customer data, for performance and productivity enhancements.

ReconAce reconditioning services – As good as new

Ensuring that components meet their original requirements. Proposing and performing agreed additional work and component replacements to bring them to as-new condition.

MaintAce maintenance services – Keep running smoothly

Ensuring components are in acceptable operational condition, saving on long-term maintenance costs.
Black pellets are a type of renewable biomass fuel that can replace fossil coal in power plants, significantly reducing carbon emissions. Steam exploded black pellets are safer, more cost-effective, and deliver more energy than conventional “white” biomass pellets. Valmet can deliver a complete black pellet production plant, from infeed of raw biomass feedstock to output of solid biomass fuel. Text: Kerstin Eriksson

Large amounts of renewable woody biomass feedstock are widely available across the globe at competitive prices. However, transporting this biomass feedstock to its final users is often inefficient, largely due to its high moisture content. This problem is solved through steam treatment of the woody biomass followed by rapid depressurization. This process creates a low-moisture material that is perfect for producing durable, water-resistant pellets or briquettes. Such pellets are excellent for safe and economical long-distance transportation, allowing power companies to take advantage of the global abundance of raw biomass supply.

A new, sustainable income stream for power plants

Introducing the Valmet Black Pellet Plant

Black pellets are a type of renewable biomass fuel that can replace fossil coal in power plants, significantly reducing carbon emissions. Steam exploded black pellets are safer, more cost-effective, and deliver more energy than conventional “white” biomass pellets. Valmet can deliver a complete black pellet production plant, from infeed of raw biomass feedstock to output of solid biomass fuel. Text: Kerstin Eriksson
Minimizing capital expenditure

The solid biomass fuel produced in Valmet’s black pellet plant is steam exploded and can thus be ground into a reactive powder suitable for burning in large-scale power boilers or in specialized pellet-burning systems. Black pellets can thus replace fossil coal up to 100% in smaller units and up to 70% in larger units. The powder produced by grinding has a relatively high bulk density and is free flowing, meaning that it is ideal as a feed material for entrained flow gasification systems as well.

“Black pellets contain and retain more energy than white pellets. There is no self-heating or off-gassing, and the low amount of dust minimizes the risk of fire hazards. They grind and burn more like coal than white pellets, which saves customers both capital and operational expenses,” says Mattias Erixon, Senior Sales Manager at Valmet.

“Valmet offers both complete production lines for steam exploded black pellets and revamps of existing white pellet plants. These high-energy-density, water-resistant pellets are suitable for transportation and open up opportunities for new income streams for our potential utility customers. Valmet’s technology is safe, as the process is based on the use of steam, with no chemical additives such as binders for the densified product. The environmental performance is built to meet any local requirement by using our in-house experience and technologies for cleaning gas and water.”

“Valmet and Zilkha’s collaborative agreement

Zilkha Biomass Energy LLC in the USA and Valmet have signed a five-year collaboration agreement in the field of steam exploded black pellets. The purpose of the agreement is to bring steam exploded black pellets to the global market. Combining Zilkha’s profound expertise in pellet production and distribution with Valmet’s excellent equipment design and project delivery capabilities brings great opportunities to develop and exploit this new emerging technology. The parties will work together to develop a joint global offering.”

Proven and safe technology

Valmet’s steam explosion technology is based on decades of experience arising from numerous deliveries of projects to the fiberboard and chemical pulping industries.

“We can offer a solid technical solution with a reliable base, minimizing the technology risks of a steam exploded black pellet project. We have already completed several full-scale tests in European and Asian coal units”, Erixon continues. Valmet’s technology partner Zilkha Biomass has already completed nine full-scale tests of the final black pellet product at utilities across Europe and Japan, in units ranging from 80 MW to 500 MW in size. In total, over 9,000 tonnes of black pellets have been tested by potential utility customers.

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New solutions for reducing dust emissions from pulp mill chemical recovery.

The amount of dust emitted from recovery boilers, lime kilns and power boilers can be reduced with Valmet’s high-performance electrostatic precipitators (ESP). Based on the company’s knowledge of processes and operations and integrated with its automation systems, Valmet’s new range of ESPs offers more opportunities when selecting technology or upgrading in the pulp and paper industry. A comprehensive offering helps pulp and paper producers prepare for the coming emissions directives in the EU.

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Positive trend in environmental performance

Sulfur emissions into the air have been sharply reduced in recent years by substantial progress in process technology. Now a new step is approaching.

A new industry emissions directive from 2014, 2014/687/EU, also known as the “BAT (Best Available Technology) conclusion”, applies to the pulp, paper and board industry. This directive describes emission levels for new and existing recovery boilers and lime kilns. The deadline for achieving the new levels is September 2018.

Many companies have already investigated and planned upgrades for processes and emissions that will help to meet or even remain below the limits of the directive. Valmet is offering support and technology solutions for this.

When it comes to operating mills according to emissions guarantees, it is essential that the equipment is reliable. Companies must succeed in operating in line with set values – with no exceptions. “We at Valmet are committed to giving our customers effective, reliable and competitive solutions and products so that pulp, paper and board makers can meet future challenges and improve their results. Our understanding of the main process – in this case boilers and lime kilns – was an excellent foundation for developing our comprehensive solutions to lower emissions,” comments RTD Manager Jaakko Rintanen.

Reliability and high performance with ESP

Valmet has focused its ESP development efforts on reliability and high performance. “Since the start of ESP development, we have created an entirely new operational concept that provides concrete synergistic effects throughout the life cycle of the ESP,” says Juha Tolvanen, Product Manager for ESP Technology.

Ordering the ESP and the boiler from a single supplier ensures that the overall project is well managed, including technology performance and site operations. Maintenance and upgrading services can be planned over the entire life cycle. ESP control and information gathering is fully integrated with Valmet’s automation systems and becomes a natural part of the plant process. It can easily be managed in the same control room as an essential part of the process.

A solid track record

Valmet delivered the first ESP solutions for power boilers in 2010. The first Valmet recovery boiler with a Valmet ESP was taken into operation in 2015, and more recovery boiler ESPs will start up in 2016 and 2017. The latest deliveries include ESP solutions especially developed for large, heavily loaded recovery boilers.

Södra Cell AB, Värö, Sweden

The Värö mill is going to increase its pulping capacity by 64%, and Valmet is supplying equipment to all process areas. As the capacity of the recovery boiler grows, more ESP capacity will be needed as well.

Valmet’s solution is an additional ESP unit with four fields and dimensioned dust emissions of below 25 mg/Nm³. A control system from Valmet (Valmet DNA ESP) will be connected to the existing ABB DCS. The start-up will take place in 2016.

Metsä Fibre Oyj, Äänekoski

Bioproduct Mill, Finland

Recovery boiler: Valmet RECOX with Valmet ESP, 7,200 tDS/d

Metsä Group is building a next-generation bioproduct mill in Äänekoski. Valmet is delivering the new RECOX recovery boiler with four ESP units with five fields. The dimensioned dust emissions are below 25 mg/Nm³. Valmet’s DNA ESP control system will be connected to a Valmet DNA DCS system. The start-up will be in 2017.

Oulu Energia Oy, Toppila 2, Finland

ESP upgrading, two units

For the Oulu Energia power plant, Valmet supplied a power boiler ESP. The Oulu ESP has 2×3 fields and a Valmet DNA ESP control system. The measured dust emissions are below 3 mg/Nm³, and there is an emission guarantee of below 10 mg/Nm³. This ESP provides improved wet stage flue gas heat recovery performance and makes the plant ready for ‘BAT (Best Available Technology) conclusion’.

For Forward 1/2016

INNOVATOR’S VOICE

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Valmet works systematically to ensure more responsible business practices throughout its global supply chain. Close collaboration with our suppliers also leads to increased customer benefits and enhanced transparency in the value chain. The circulation of stainless steel, a key material in Valmet’s technologies, well demonstrates how a seamless supply chain accumulates synergies.

Valmet strives to ensure that it operates responsibly throughout its entire value chain and that the materials and components it procure comply with relevant local and global regulations and standards. Our sustainability requirements for suppliers – the Sustainable Supply Chain Policy – act as the starting point for entering into and maintaining all business relationships with Valmet. The policy applies to all Valmet’s suppliers in over 50 countries around the world.

“To be the responsible and trusted partner our customers and other stakeholders expect us to be, we need to ensure that sustainability is an integral part of our procurement process,” says Laura Puustjärvi, Head of Sustainability at Valmet.

Ensuring a sustainable supply chain
In order to ensure effective implementation of and compliance with its supplier sustainability requirements, Valmet has rolled out a comprehensive set of global activities, including supplier sustainability risk assessments, supplier self-assessments and auditing practices, as well as procurement personnel training.

The implementation of all these tools and practices is proceeding at a good pace. All 9,000 active Valmet suppliers have undergone risk assessments based on country of origin and purchasing category. About 74% of all Valmet purchases are sourced from low-risk countries.

The supplier sustainability risk assessment may lead to a self-assessment of a supplier’s
To assess the impact of its value chain, Valmet has a similar system to document the materials used in its products, the traceability is guaranteed all the way back – and forward – in the supply chain. When a machine or a machine part produced by Valmet has come to the end of its lifetime, the stainless steel and other raw materials used in them can be easily recycled due to the detailed information Valmet provides.

Optimized product design is a common effort

The close cooperation between Valmet and Outokumpu has also led to the highly optimized use of stainless steel in Valmet’s technologies, such as paper machine headboxes and suction rolls. This means that the right amount of material with the right properties to meet the operational requirements and the requirements imposed by the operating environment is used in the production of paper machines. This results in better environmental performance, material efficiency and cost management.

Outokumpu’s tracked data forms the basis of continually updated product statements and declarations. Using impeccable and ethically grounded processes, Outokumpu knows the origin of its virgin alloys, meaning customers can rest assured that conflict materials are excluded, to give one example. Additionally, strict controls are applied to the quality of recycled material.

High content of recycled material benefits all

Stainless steel is fully recyclable, and it can be recycled multiple times without losing any of its properties. In fact, steel is the most recycled material in the world. The recycled content of Outokumpu steel is 85% on average, compared to the industry average of 50%

Customer benefits:
- environmental performance
- cost-efficiency
- optimal material properties
- ethical business practices and compliance with laws and regulations
- transparency and traceability

Collaboration between Valmet and Outokumpu guarantees traceability throughout the entire supply chain.

The recycled content of Outokumpu steel is 85% on average, compared to the industry average of 50%.
Metsä Board’s coated board line starts up in Sweden

The coated board production line for Metsä Board, part of Metsä Group, has started up at the company’s Husum mill in Sweden. The new machine produces high-quality folding boxboard with an annual capacity of 400,000 tonnes with a basis weight range of 185 - 350 g/m². Valmet’s delivery included a board machine, a rebuild of the off-machine coater, winder and the roll wrapping line.

Meet Valmet at Power-Gen Europe

Come to meet Valmet at the Power-Gen Europe exhibition in Milan, Italy, on June 21-23, 2016.

Meet Valmet at Zeilcheming

Come to meet Valmet at Zeilcheming exhibition in Frankfurt, Germany, on June 28-30.

Meet Valmet at Tissue Making Days

Come to meet Valmet at Tissue Making Days in Karlstad, Sweden, on June 15-17.

Meets Valmet at Tappi PaperCon

Come to meet Valmet at Tappi PaperCon conference in Cincinnati, Ohio, USA, on May 15-18.

Around the world

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 its customers to move their performance forward.

Prehydrolysis system started up in Thailand

A Valmet supplied prehydrolysis system was successfully started up in 2015 at Thai Rosonc Rung Energy Co., Ltd. [TRE] in Saraburi, Thailand. The system has been installed as the pretreatment stage in a bioethanol production plant. The plant has a process capacity of 1,300 tonnes of bagasse per year and it produces 100,000 liters of bioethanol annually.

New bleaching system to Rottneros in Sweden

Valmet will deliver a new high consistency bleaching system to Rottneros pulp mill in Sweden. This is the first step in a larger rebuild project, which will be completed in 2017 on the 600 000 t/a pulp mill. The long term goal is to increase both availability and the total production volume of Rottneros two pulp mills to 500,000 tonnes per year.

New coaters started up at Mayr-Melnhof in Slovenia

New coating technology, featuring multilayer curtain coating, has been started up at Mayr-Melnhof Koll gốcove board machine 3 in Slovenia. Valmet’s delivery included a new OptiCoat Layer curtain coater with supply system and a new OptiCoat blade coater.

Valmet will deliver a pulp cooking plant to Siam Cellulose’s Ban Pong pulp mill in Ratchaburi, Thailand. The mill will produce 70,000 tonnes per year of eucalyptus pulp, and the start-up is scheduled to be in December 2016. Valmet has a long standing customer relationship with Siam Cellulose. This is the third CompactCooking system delivered to Siam Cellulose’s mills in Thailand.

CIECH Soda Polska orders a flue gas desulphurization plant

Valmet has signed a contract with CIECH Soda Polska S.A. for the supply of a flue gas desulphurization plant (FGD) to Soda Polska’s Jaworzno combined heat and power (CHP) plant in Poland. This is the second order of a FGD plant from CIECH Soda Polska.

New aqua cooling calendering technology now available

Valmet has introduced new aqua cooling calendering technology which is based on the paper web being cooled down by evaporating moisture from it. The first installation has been taken into use at Stora Enso Ingerey Board Mill in Finland.

Siam Cellulose orders pulp cooking plant

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Automatic technology to Turkey

The Turkish combined cycle power plant Plantatik Clas- sicören in Kirklareli has ordered a Valmet DNA automation system and a plant information and performance monitoring system. The 1200 MW gas-fired power plant is due to start generating electricity in 2017.

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Valmet is a leading global developer and supplier of services, automation and technologies for the pulp, paper and energy industries. Our 12,000 professionals around the world work close to our customers and are committed to moving our customers’ performance forward – every day.

Increased customer value with comprehensive offering
Valmet’s second year as an independent company was successful in many ways. In spring 2015, Valmet took a natural strategic step and acquired the process automation business. By uniting automation expertise with our pulp, paper and energy technology and process know-how within the same company, we created a strong platform to move our customers’ performance and the whole industry forward. This was an important step towards our vision – to become the global champion in serving our customers.

Profitability and market position improved
During the year, Valmet was able to improve its profitability to the targeted range with an EBITA margin of 6.2% (4.3%). Both orders received (6%) and net sales (14%) increased in the Services business line which together with the Automation business line ("stable businesses") accounted for 46 percent of Valmet’s net sales. We also succeeded in strengthening our position in the paper industry, and Valmet is now the market leader in paper and board technologies.

Strong focus on safety and sustainability
As a result of our long-term focus on occupational safety and safety culture, our safety results continued to improve and we were able to reach an LTIF of 3.3 by the end of the year (2015: 5.5). As a token of our strong overall sustainability work, Valmet was selected to the Dow Jones World Sustainability Index as being among the 317 most sustainable companies in world for the second year in a row.

Enhancing technological leadership
In 2015, Valmet invested EUR 59 million in research and development in 2015. Going forward, the focus areas of our research and development work are to ensure advanced and competitive technologies and services, to enhance raw material, water and energy efficiency, and to promote renewable materials.

One of the highlights of 2015 was the launch of the Valmet IQ product family for online quality control and monitoring of the paper and board-making process. In 2015, Valmet also sold its tenth OptiConcept M machine and sixth Advantage NTT tissue machine which represent our new and advanced paper, board and tissue making technologies.

The acquisition of Automation has strengthened Valmet’s position as the forerunner in Industrial Internet. In the coming years, we will introduce even more advanced automation technologies and embedded diagnostics in our customers’ production processes.

Committed team ready to serve
Valmet has today over 12,000 employees around the globe, working close to our customers. The results in our employee engagement survey improved in nearly all questions in 2015, with total employee engagement increasing globally by nine percentage points. We will continue our efforts to build and maintain an engaged and performance-driven team close to our customers all over the world.

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Read more at valmet.com/energy