

A STORY FROM
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ANDRITZ
Pulp & Paper

SHANDONG SUN HONGHE

Repositioned and relocated

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REPOSITIONED AND RELOCATED

for success

Sometimes, companies need to reposition themselves to meet changing requirements and future challenges. Sun Paper repositioned a pulp mill ... literally ... from Laos to China. With location and fiber mix changing, ANDRITZ needed to demonstrate the utmost flexibility.

"The main factor for the change in location was that we wanted to expand our market share into new areas, such as viscose pulp for the clothing industry," says Liu Yanbo, Sun Paper Project Director. "It was a logical extension to our previous investments in China."

Originally in 2011, Sun Paper Holding Lao Co. ordered woodyard, fiberline, pulp drying, and white liquor production systems from ANDRITZ for a greenfield project in Laos. "The selection of the main supplier was quite easy, as ANDRITZ benefits were so favorable," Mr. Liu says. "Their strengths are their knowledge of advanced pulp technologies coupled with high-quality equipment and experience executing projects in different cultures."

ANDRITZ completed the engineering and manufactured the equipment. Shipments were made to Laos in the summer of 2012. At that point, Sun Paper suspended the project.

Rethinking requires flexibility

After resetting its strategy and location, the project continued in late 2014. Zoucheng (Shandong Province) in China was the chosen location. The new mill is about 30 km from Yanzhou, where Sun Paper's large mill complex and headquarters are located. Following an amazingly rapid erection phase, the mill start-up was in late 2015.

Naturally, the change in the mill's location and raw material supply caused some extra

challenges. ANDRITZ consulted with its customer to adjust for a new environment. The key for Sun Paper was to have flexibility – in fiber source and in end product.

"The Laos mill was going to use plantation eucalyptus and acacia solely," Jorma Olkkonen, a senior fiberline project manager and ANDRITZ overall Project Director, explains. "The decision to include long fiber required us to make some changes to our woodyard and fiberline systems to obtain the required process values."

Today, the Zoucheng mill is planning to swing pulp production from hardwood to softwood – and from dissolving to kraft. Design capacity is 850 t/d dissolving or 980 t/d bleached kraft pulp. The fiber sources are eucalyptus and acacia that are chipped off-site and transported to the mill, as well as softwood chips from different sources.

Solid foundations with long-term partnership

ANDRITZ was able to dedicate a project team who had a long history of cooperation with co-operation with Sun Paper and had established solid and excellent relationships. "I have known Jorma Olkkonen almost 20 years," Mr. Liu says. "We have worked on several projects together. I have learned to trust his skills and expertise. His experience in managing large projects successfully was very important for us."

"Our long-term partnership ensured good cooperation during the project execution here in Zoucheng," Olkkonen says. "This has made it possible to fast-track the project with efficient erection, commissioning, start-up, and optimization."

A fiberline with flexibility

ANDRITZ's scope for the Zoucheng project included woodyard equipment, the complete





▲ Following the new continuous digester are multi-stage DD Washers for brownstock washing and post-oxygen washing, and a single-stage DD washer after every bleaching stage.



▲ The mill's new white liquor plant from ANDRITZ has capacity to produce 4,800 m³/d of white liquor. The LimeKiln shown here can produce 400 t/d of returned lime.

fiberline, the white liquor plant, and the drying plant.

ANDRITZ provided the basic engineering and technology for the receiving hopper for market chips and a scalping disc screen before the new gyratory chip screen. The chip screen, with a capacity of 700 m³/h, ensures that incoming chips are of optimum size for the cooking plant. Oversized chips are treated in a new ANDRITZ rechopper. Fines are burned in the boiler.

The mill plans to swing between kraft and dissolving pulp depending on market demands and fiber availability. Twin vessels in the cooking plant (a pre-hydrolysis vessel and a traditional digester vessel), plus a streamlined chip feeding system, make this flexibility possible. The continuous cooking plant includes a Diamondback chip bin for uniform heating of the chips and uninterrupted feed to the pre-hydrolysis vessel (PHV). A patented TurboFeed chip pumping

system transports the chips to the top of the PHV, which then feeds the digester itself.

The high cellulose purity required for dissolving pulp is achieved by pre-hydrolysis kraft cooking. The process begins in the PHV by auto-hydrolysis, which removes most of the hemicelluloses prior to normal kraft cooking. The PHV integrates well with the digester for swings from kraft to dissolving pulp. "Smooth transitions are essential to the mill's productivity and efficiency," notes Olkkonen. "The same fiber source is handled in different ways to make entirely different products."

Following the digester are multi-stage DD Washers for brownstock washing and post-oxygen washing, and a single-stage DD washer after every bleaching stage. The screen room is equipped with pressure screens (ModuScreen), as well as a knot separator, knot washer, and reject washer.

White liquor production

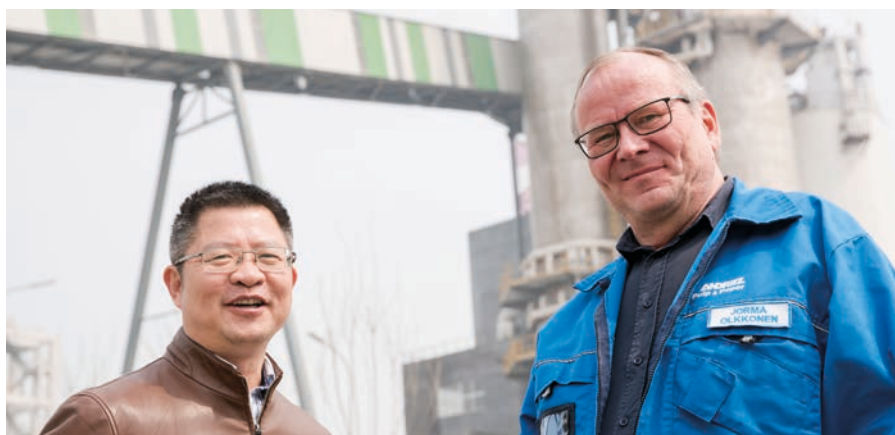
The mill's new white liquor plant has capacity to produce 4,800 m³/d of white liquor. The LimeKiln can produce 400 t/d of returned lime. "Included in our delivery was the LimeGreen filter for removing nonprocess elements and a LimeFree centrifuge for dewatering green liquor dregs," Olkkonen says. "A LimeSlake system is used for slaking the lime mud in the recausticizing process."

White liquor is filtered through a pressurized disc filter (LimeWhite). A LimeDry unit is the latest technology for lime mud dewatering and washing. It provides large-volume filtration in a small footprint. The kiln itself is equipped with a LimeFlash head where lime mud is flash pre-heated prior to burning it in the kiln. Since kiln exit gases are recovered to flash dry the mud, energy is saved.

Efficient drying and baling

ANDRITZ's delivery of the pulp drying plant (1,200 admt/d of kraft or 950 admt/d of dissolving pulp) has some advanced and innovative energy-saving technologies to reduce Zoucheng's operating costs, according to Klaus Pöschl, Director of Sales for pulp drying systems at ANDRITZ. For example, dewatering is performed in an energy-efficient Twin Wire Press that minimizes vacuum requirements in forming and dewatering. An airborne sheet dryer, a high-speed cutter/lay-boy (sheet width 4.7 m), and one automated baling line complete the package.

"Commissioning and start-up were extremely efficient and successful," Pöschl says. "The plant was in commercial operation only two



▲ Almost 20 years being colleagues and friends, a sustainable relationship based on respect and understanding Yanbo Liu (left) and Jorma Olkkonen (right) stand in front of the ANDRITZ digester.



▲ ANDRITZ provided the basic engineering and chip screening technology ensuring that incoming chips are of optimum size for the cooking plant. Oversized chips are treated in a new ANDRITZ rechipper.



▲ ANDRITZ's delivery of the pulp drying plant (1,200 admt/d of kraft or 950 admt/d of dissolving pulp) has some advanced and innovative energy-saving technologies to reduce operating costs.

months from the beginning of the commissioning phase. The start-up was excellent with a steep ramp up curve."

Punctual performance, detailed planning, great results

The start-up of the new plant took place late 2015. Fine-tuning and optimization are continuing.

"The good results and experiences derived from this project make us more confident making investments anywhere in the world," Mr. Liu says. "Sun Paper has a reliable partner in ANDRITZ. We have done projects for kraft and mechanical pulps, as well as stock preparation systems and even tissue machines."

According to Mr. Liu, "Runability has been excellent with only scheduled shutdowns. We are also able to exceed the new environmental regulations set by the environmental regulators."

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FUTURE INVESTMENTS and the environment

Interview with Ying Guangdong, Vice President, Sun Paper Group

"Sun Paper is very pleased with this project, and we can see a bright future for our company. We have new investment plans in the near future both in Laos and in the United States.

"We have had a strong relationship with ANDRITZ for nearly 20 years. We rely on ANDRITZ to continue with its in-

novations, advanced technologies, quality products, and services. R&D plays a pivotal role in maintaining an edge.

"China is today experiencing an oversupply in industry, even the paper industry. Growth is



▲ Ying Guangdong, Vice President, Sun Paper Group

predicted to be slower but the Chinese markets will adapt accordingly. The three decades of rapid growth in China have had impacts. Our future will be more environmentally focused. Generating sustainable products that meet our environmental commitments will be vital.

"As has been previously announced, we are engaged in discussions with the state of Arkansas to build a greenfield mill in the USA. Environmental permitting will take up to eight months, and we expect to have the mill operational in 2019. Within the next five years, our breakdown of production will be 40% paper, 30% consumables, and 30% biomaterials."

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