

Moving (and removing) improves bleaching for NSI

Norske Skog's Saugbrugs mill in Norway has stood the test of time. It marks its 150th anniversary this year. Within the last two years, the company has upgraded bleaching systems for its #4 and #5 paper machines with some unique approaches – invented and implemented in cooperation with ANDRITZ.

In this economy, Norske Skogindustrier (NSI) is trying to continuously upgrade its efficiencies without large capital outlays. The upgrades of two bleaching systems for the Saugbrugs Mill are good examples.

The most impressive of the two projects was the removal of a complete bleaching system from the former NSI Union Mill, transporting it to Saugbrugs, and rebuilding it there. ANDRITZ was the service partner for accomplishing this relocation, rebuilding, installation, and start-up of the equipment.

By comparison, the first project (rebuilding the bleaching system for PM4) was easier. The mill's aim was to decrease the chemical oxygen demand (COD) in the effluent and to increase capacity. To meet these requirements, ANDRITZ modified the bleaching tower and increased the tower feeding consistency by upgrading a twin wire press for higher outlet consistency. It was upgraded with a drive roll press nip and new individual drive.

To raise the capacity for future needs, ANDRITZ also upgraded the headbox and floating wedge of a twin wire press used for post-bleach washing (converting from low-consistency to medium-consistency).

"The rebuild performed by ANDRITZ followed the schedule, started up without problems, and has performed to expectations. The service provided by the ANDRITZ team was perfect!"

Ben-Johan Gottberg, Senior Project Manager for Saugbrugs (now retired)



In addition, the bleaching chemistry was changed. The result of all this was that less bleaching chemicals were required. This lowered the COD in the effluent being discharged to the Tista River.

The main deliveries from ANDRITZ were a new bottom part of the bleaching tower (for larger volume) and a new MC tower discharge, which allowed for a compact (less space intensive) layout.

Tight schedule, all promises kept

Delivery of the ANDRITZ equipment started in August 2008. One of the main challenges was the tight schedule: layout, delivery, rebuild and start-up were all conducted within a year. The layout was rather complicated due to the location of the bleaching tower, which was very close to an existing tower.

"Only one additional screw conveyor was needed, and the compact design of the HC/MC tower discharger with the integrated MC pump made it possible to cope with the small space available," says Josef Liendl, ANDRITZ's Sales Manager. "We had several good discussions with NSI before the final concept and layout was fixed. In the end, we were able to put our equipment on a lower elevation, allowing for a larger tower volume."

The solution provided the customer an additional advantage: very little new equipment was needed. The new layout allowed the use of all existing screw conveyors, and the existing HC mixer was already designed for higher capacity.

Another positive: only a short production stop was needed, as most of the bleaching tower erection could be done during normal mill operations.

Ben-Johan Gottberg, Senior Project Manager for Saugbrugs (now retired) is very positive. "The rebuild performed by ANDRITZ followed exactly the agreed schedule," Gottberg says. "The start-up proceeded without problems. The plant has performed to expectations since start-up. We have not had to stop to make correc-



▲ Solid performance. Ben-Johan Gottberg of NSI, Josef Liendl of ANDRITZ, Andreas Kvitvang of NSI, and Rikhard Blomqvist of ANDRITZ relied upon good communications to handle the complex details of the two bleaching projects at Saugbrugs (left to right).

▲ The layout allowed for crane access to place the rebuilt twin wire presses (shown) and to relocate a bleaching tower brought from the nearby Union Mill.

tions. The service provided by the ANDRITZ team was perfect!"

The targets for COD reduction were met and actually exceeded by 30-40%.

The second project involved logistics that were somewhat more complex and delicate, according to Gottberg. The existing bleaching line for PM5 for SC++ grades at Saugbrugs used dithionite only, and could not produce the brightness that the mill desired.

Now, move a bleaching tower

The bleaching tower that NSI wanted to rebuild was located at the Union Mill in Skien, on the opposite shore of the Oslofjord. NSI had closed the Union Mill a few years ago. The Union Mill's high-consistency peroxide bleach plant was just what was needed at Saugbrugs.

"The Union Mill's tower had to be dismounted and transported to Saugbrugs. Transport began by truck, then by barge, then back to the narrow roads again. Finally, the five-meter diameter tower had to make it through the narrow entrance between the hill and the mill. Due to the tight fit, each centimeter had to be calculated and perfectly measured," says Ewald Kulhanek, ANDRITZ's Product Manager.

"ANDRITZ did the entire move," says Kjell-Arve Kure, Production Manager at Saugbrugs. "We knew what was going to happen and monitored it from the sidelines, but were not involved. We thought that they might encounter problems with the tight spaces, but none surfaced. All parts of this service promised by ANDRITZ went exactly according to plan."

To make it more interesting, there was very little room at the Saugbrugs site for laydown and installation of the tower and other equipment. "This is to be expected when you do rebuild services in existing mills," Kulhanek says. The equipment included two twin wire presses, whose headboxes were converted from low-consistency to medium-consistency and whose nips were converted from fixed S-Rolls to S-Roll Press Nips. Also moved from Skien were a mixer and three screw conveyors. New equipment from ANDRITZ included three screw conveyors, new vapor hoods for the presses, a new MC discharge system, and the bottom part of the bleaching tower.

"The Union bleach plant had double the capacity we needed at Saugbrugs," says Kure. "Since there were two twin wire presses in parallel at Union, we decided to use one of them upstream of the HC Mixer and bleaching tower, and one of them for post-bleach washing."

So far so good

Where to put the equipment? Again, the layout was the most difficult part of the project. "We agreed on a 'close to perfect' layout which allowed crane access to the twin wire presses, and found room for the bleaching tower in the tight space between a building and an unmovable rock facade bordering the mill," says Andreas Kvitvang, Process Manager at Saugbrugs.

ANDRITZ and Saugbrugs had a good and close cooperation during the whole project. Thanks to close communications, necessary corrections were detected early, and rectified accordingly without incident.

During the most hectic periods of commissioning and start-up, brief meetings were scheduled in the morning and late afternoon. Worker safety is a major concern to NSI. "We managed to avoid accidents," Kure notes with satisfaction.

A perfect match

PM6 has a peroxide bleach plant built in the 1990's. As the processes for PM5 and PM6 are rather equal, there is a need to use the same quality of pulp, with the same basic brightness level. This is now the case: Saugbrugs can deliver to its customers identical paper quality from both PM5 and PM6 - SCA rotogravure paper of top printability and high brightness.

"ANDRITZ did the entire move. We thought there might be problems, but none surfaced. All parts of this service promised by ANDRITZ went exactly according to plan."

Kjell-Arve Kure, Production Manager at Saugbrugs



"The trend is for mills to purchase and relocate used equipment. Our service teams are experts in relocating, rebuilding, upgrading, and starting up used equipment in a cost-effective way."

Ewald Kulhanek, ANDRITZ Product Manager

A tight fit. The bleaching tower relocated from the Union Mill for PM5 at Saugbrugs was erected between the building and an unmovable rock wall bordering the mill. ▼



"All three paper machines now have peroxide bleach plants with ANDRITZ presses," Gottberg explains. "The presses are built very solid and sturdy. This gives very high availability, excellent reliability, and very few disturbances due to mechanical failure." And, with similar bleaching on all three machines, "The white water properties are chemically similar," Gottberg says. "This stabilizes production on all the machines."

Rikhard Blomqvist, ANDRITZ's Service Sales Manager, gives full credit to the cooperation between the two partners during the projects: "We have open discussions and a good relationship between NSI and ANDRITZ. The PM4 project was a good foundation for the PM5 project - a natural transition."

He says that even for ANDRITZ, the PM5 project was special, as the bleach plant was moved from another mill and blends existing systems with new equipment. "This shows ANDRITZ's strength," Blomqvist says.

Kulhanek agrees. "The trend is for mills to relocate used equipment from other mills in order to get low-cost solutions," he says. "We bring our expertise in helping customers decide what to relocate, what to rebuild, and what to replace. Quite often, we can upgrade components to produce a system that is state-of-the-art. In addition, we commission and start up the equipment and get everything to work without major problems. In the Saugbrugs case, both bleach plants started well and met the guaranteed values."



▲ Through the roof. The rebuilt bleach tower for PM4 was carefully lifted and lowered through the roof in the bleach plant building.

The new MC discharge equipment and the rebuilt bottom portion of the bleaching tower for PM4. ▼



FIND OUT MORE AT
www.spectrum.andritz.com