

PROCESS OPE

Improving operations without capital investments

A service called Process OPE is helping improve the performance of white liquor plants in three of Arauco's mills. The main focus is on reinforcing the best practices for operations, troubleshooting, and maintenance by transferring knowledge from the specialists at ANDRITZ to mill personnel.

OPE (Overall Production Efficiency) is a contract service created by ANDRITZ in Finland many years ago. In its grandest form, OPE involves contract maintenance and process improvement services for an entire production line or a mill. But there are other versions, like Process OPE, which focus on very specific areas in a mill.

"Process OPE has ANDRITZ specialists working side-by-side with mill personnel to reinforce best practices for operations, troubleshooting, and maintenance," says Jari Kapanen, Global Product Manager for OPE services. "It is very much a transfer of knowledge from our experts to mill personnel."

Process OPE has been "exported" for the first time to a customer in Chile – Arauco. What Arauco finds intriguing about the service is not only what it includes – but also what it avoids. Typically, it avoids the need for capital investments to achieve performance improvements.



"New equipment does not guarantee boosts in operational performance," says Harri Soila, General Manager of ANDRITZ Chile at the time and very much involved in the initial discussions with Arauco. "It always comes down to people. Process OPE is designed to improve the skills of some of Arauco's people in a structured way."

Results-focused

Arnoldo Jara, Kraft Mill Service Manager for ANDRITZ Chile, is the Project Leader on the ANDRITZ side. "This is the first OPE Process assignment outside of Europe, and the first in South America," Jara says. "It is an important step for us here and we are closely monitoring the results closely."

It is this "close monitoring of results" that sets OPE apart from traditional training or process troubleshooting, according to Luis Vera, Arauco's Superintendent of Reliability who also serves as the Project Manager for



▲ Jari Kapanen, ANDRITZ Global Product Manager for OPE

this unique project. "Very early, we agreed on how success would be measured using Key Performance Indicators (KPIs). It was very positive for us to see that ANDRITZ is willing to tie its compensation to achieving key results."

Three mills – three bottlenecks

Three of Arauco's mills in Chile – Constitución, Licancel, and Horcones – were selected to be

The Constitución mill: "LOTS OF YOUNGER OPERATORS"

Arturo Jimenez, Mill Manager

"To produce special pulps like 'low kappa', we need more white liquor – so the pressure is always on the white liquor plant not to be the bottleneck.

We burn our CNCGs (concentrated non-condensable gases) in our kiln, and we see more ring formation. This is one of the reasons we take two shutdowns a year (May and October). If we can eliminate the ring problem, we would be fine with one annual shutdown.

When I first heard about Process OPE, I was very interested. One of our challenges here at Constitución is what I call the knowledge gap between veteran operators and younger ones – and we have quite a few younger ones. You see a difference in terms of how the younger operators make more changes to the process. There is a difference in performance from shift to

shift – so this shows that there is a need for better training.

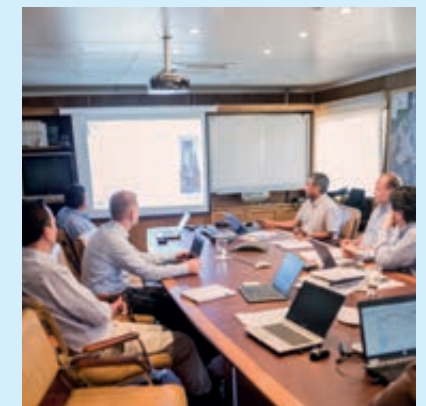
Having our people work directly with ANDRITZ is a different approach for us. The ANDRITZ people are very professional. They do excellent planning and scheduling. And, they have formed excellent relationships with our people.

We don't have many hard numbers yet because the OPE process is still very new. But I know we are heading in the right direction because operations are more stable than they were before. ANDRITZ has suggested some changes and these changes are working.

I like the OPE approach. We need to do similar work in other recovery areas since we are recovery-limited. I am looking forward to continuing."



▲ Arturo Jimenez, Mill Manager



▲ OPE status meeting at the Constitución mill

part of the first Process OPE project. More specifically, the three white liquor plants. "We had similar situations at each mill," Vera explains. "When analyzing reliability issues, we identified several with white liquor plant performance – older equipment, some younger operators, ring formation in the kilns, stability issues, etc. This all contributed to the white liquor plants becoming bottlenecks at all three mills."

According to Vera, the traditional way for Arauco to solve such a problem would be to call in a supplier or outside expert to fix it. "But, when the experts left, the knowledge left with them," Vera says. "With OPE, the knowledge is being transferred inside our mills and the follow-up occurs by our own people. This gives us a repeatable process to avoid duplicating problems."

Arauco views the white liquor plant Process OPE as a pilot program. The concept was presented to all mill managers and they are watching closely. "If we achieve success in meeting the critical KPIs," Vera says, "we will extend the work to other process areas and other mills."



▲ Michael Krainz, General Manager of ANDRITZ Chile, participated in the steering committee meetings with Arauco for the OPE project.

The one-year Process OPE project was kicked off in 2014. KPIs for each mill were identified (such as improvements in equipment availability and in white liquor quality). ANDRITZ then performed a thorough process analysis at each mill. For this phase, two top ANDRITZ white liquor plant experts from Finland, Pertti Ronkanen, Senior Process Specialist, and Jari Pääkkönen, Process Engineer, were brought in.

"Our first Process OPE contract outside of Finland was in Austria on a white liquor plant," Pääkkönen says. "The equipment was fairly new, but the customer wanted to achieve all of the maximum values. Most mills running well don't even think about OPE, even though there is always an opportunity to raise performance."

The Licancel mill: “IT PUTS US IN CONTROL”

Alvaro Mancinelli, Mill Manager

“This is a small, but special mill in that we are flexible. We produce bleached and unbleached, hardwood and softwood. Production is about 450 t/d.

We are pushing for more production here. Many of these pushes require a change in the way our equipment is operated. There is a huge difference between operating a white liquor plant, and optimizing it.

In the past, when we had a process problem, we would call a process consultant. That person would come to the mill, analyze the problem, and hand us a report. Very little knowledge was transferred to our people.

We decided to try ANDRITZ OPE because it is focused on leaving knowledge here with our operators. The hope is that next time we will solve the problem internally. I think that it's a better approach.

We need to have tighter control of our processes to reduce variability. But tighter

control requires deeper operator knowledge. This investment in training is every bit as important, perhaps more so, than investments in equipment.

We used to have to shut down the kiln about three times a year to blast the ring formation. Now we are trying new practices and procedures that have helped. In the short time that ANDRITZ has worked with us, we have improved our recausticizing process and the lime mud precoat filter. ANDRITZ has helped us tune these things to higher levels of performance.

When operators see the improvements, they are anxious to do more. ANDRITZ people have a good way of explaining things – not making operators feel embarrassed for asking questions.

Instead of a one-time fix from an outside consultant, we now have ANDRITZ OPE experts working with our operators many times, so that the operators don't forget and it becomes routine.”



▲ Alvaro Mancinelli, Mill Manager



▲ Pertti Ronkanen (left), ANDRITZ Senior Process Specialist, with Cesar Gonzalez, Arauco Process Engineer

Focusing on root causes

And now, the concept has spread to South America. “The work here is different, as the equipment is not new – but the approach is the same,” Päykkönen explains. “A customer has a problem, and has ideas on what is causing the problem. Our value as equipment and process experts is in being able to focus the customer on the root cause of the problem. In many cases, this is further upstream than where the customer was initially focusing.”

For example, one root cause of Arauco's kiln issues was the variability in green liquor density. “Control of the green liquor coming from the recovery boiler varies considerably,” Päykkönen says. “It is virtually impossible to



▲ Luis Vera, Arauco Project Manager for Process OPE

stabilize the white liquor plant with fluctuations in incoming raw material quality. We also recommend that Arauco move from the old-style,

single-loop control of density to the three-loop control that modern mills use.”

For his part, Ronkanen works side-by-side with operators to improve basic control of the recausticizing process, such as monitoring temperatures of the slaker and the green liquor to control lime additions. “With Process OPE, all the changes are made by operators and maintenance people, not by us,” Ronkanen explains. “We discuss and train people on new ways of operating, but the actual decisions and work are carried out by mill people.”

The training sessions are very small, maybe three to four operators with one ANDRITZ

The Horcones (Arauco) mill: “OPPORTUNITY TO OPTIMIZE”

Mario Vergara, Mill Manager

“Our first production line began operating in 1972, and our second line started in 1991. The white liquor plant, with few exceptions, is operating with the same equipment that was installed 24 years ago. The maximum capacity of the plant is 4,600 l/min of white liquor and 455 t/d of lime.

Considering that ANDRITZ has a depth of experience in the recausticizing and kiln area, we were very open to hearing about their OPE concept. We felt that the approach would blend well with our style of interaction and feedback and would be a good opportunity to optimize our white liquor plant operations. I should point out that while we have some ANDRITZ equipment in both of our production lines, they are not the major equipment supplier.

Our white liquor plant is the process area with the most issues and the most disturbances. Ring formation in the kiln, for example, forces us to stop production of Line

#2 too often. In addition to the kiln, we have a bottleneck in producing enough high-quality white liquor for our digesters.

The main benefits that I have seen so far with Process OPE is the diagnosis and identification of the main points to be optimized. We are following these points quite closely and deviations are being dealt with in a timely fashion.

Our operators in the white liquor plant range have between one and 21 years of experience. They all, young and old, have increased their knowledge considerably through training provided by ANDRITZ. The coordination and cooperation has been good between both parties. I have observed improvements as the project progresses through its different stages.

I appreciate the company for its expertise, having good professionals with a good level of specialization.”



▲ Mario Vergara, Mill Manager



▲ Kiln at Horcones mill

instructor. The work is conducted in the control room using the DCS screens. Topics focus on practical matters: operating the equipment using key tests and critical setpoints, understanding how each adjustment can affect the overall results, and troubleshooting.

“Good work is being done”

“When I first heard about OPE, I was a little nervous,” Vera admits. “I thought that maybe the pressure to achieve KPIs would lead to pointing fingers and blaming each other for not achieving results. Now, as the project progresses, I am not so worried. We are all working together, cooperating to reach the same goals. Good work is being done.”

In the diagnostic phase, certain equipment was identified that was not operating correctly – the continuous precoat renewal filter and sludge press for example. “We have rebuilt the equipment and made adjustments to make sure this equipment operates at the correct levels,” Vera says.

“OPE is a systematic way to improve process availability,” Vera explains. “Several process trials have shown the importance of systematic development. Actions and results have been monitored continuously. The results are followed by a steering committee of Arauco and ANDRITZ managers on a quarterly basis. This committee prioritizes actions based on needs and desired results. We are on the right track.”

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▲ Estefania Schettino (left), Arauco Process Engineer, with Angelo Villalobos, Field Operator at the Horcones mill.