

## Mucuri Line 2: ANDRITZ brings its expertise to the woodyard and fiberline.

A “best in class” woodyard and cost-efficient DD Washers help Suzano operate a world-class fiberline in Bahia.



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Fabrício da Silva, Fiberline Executive Manager

In 2005, Suzano began a capital project to add a second pulping line to its Mucuri mill in the State of Bahia in Brazil. Line 1 was started in 1992. When Line 2 started up in 2007, it was the world’s largest single pulp line, with a design capacity of one million tonnes per year.

The project was packaged into eight major EPC deliveries. ANDRITZ was responsible for two major packages: the woodyard and the washing, screening, and bleaching portion of the fiberline.

### “Best in class” woodyard

“I have been involved in quite a few new greenfield lines and mills,” says Miguel Celaya, head of Engineering and Projects for Suzano. “If you do not pay enough attention to the design of the woodyard, you

will end up paying for it for the life of the mill. ANDRITZ’s woodyard technology became the obvious choice after we had carried out a thorough evaluation. I consider it to be the best in class.

“When I was younger,” he explains, “I did a special study on woodyards. Some people consider them to be ugly, expensive, and terrible places, but I don’t. I visited woodyards in the USA. They put the logs in a channel with water, then take away the bark, and then try to dry the bark to burn in the boiler. It didn’t make sense. Here, we debark the logs in the forest and put the biomass back to the land. We transport 20% less weight to the mill. And then, we have very simple lines.”

Fiberline Executive Manager Fabrício da Silva has experience with ANDRITZ woodyards at two mills. “My first experience was at Fibria’s Jacareí mill,” he says. “There we had an older technology chip storage system with screws at the bottom, and I thought it worked pretty well. But at Mucuri we have the open chip storage pile with a stacker and reclaimer. With the reclaimer, it is much, much easier to do maintenance. Yes, you have to do regular maintenance. But, compared to other systems, the performance, the production, the reliability, the capacity are all superior.”

### Looking at CapEx + OpEx

“We felt that ANDRITZ’s DD washing technology was technically superior, and we could have paid a cheaper initial price with a competitor,” Celaya says. “But we did a very careful analysis of CapEx and OpEx over 10-15 years and determined that the DD Washers have the lowest overall cost in terms of efficiency and chemical consumption. I must say, we are quite happy with our choice.”

According to da Silva, commissioning and start-up was without complications. “Our big challenge was in obtaining qualified operators,” he says. “The south of Bahia is more known for its beaches than for its pulp production. The IDEAS simulator played a big part in our start-up success. I had previous experience with IDEAS at Jacareí. At Mucuri, we did some improvements by having our operators provide input into the building of the computer model.”

“Our customers’ concerns and wishes are the most important,” says da Silva. “So for us everything is about pulp quality. Brightness, dirt content, and physical properties are values we constantly monitor. This is

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Maintenance Executive Manager



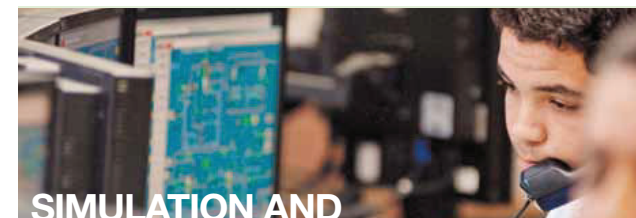
my first experience with DD Washers. I am very impressed with the washing efficiency and the low chemical costs in the fiberline due to the DD Washers. It is very good equipment.”

### Excellent cooperation: production and maintenance

“I have been impressed with the genuine concern about meeting their performance guarantees,” da Silva says. “When we talk, ANDRITZ people are always asking how the equipment is performing and if there are areas where they can improve. If we have a question, they are quick to respond and very open to discussing the right solutions.”

Reginaldo Fernandes, Maintenance Executive Manager, has a similar view. “We have excellent cooperation from ANDRITZ whenever we have a question or problem,” he says. “From a maintenance view, we can really notice the difference between equipment suppliers. We have more problems with equipment not supplied by ANDRITZ, that is a fact.”

Fernandes and his team are midway through a program to ensure world-class maintenance at Mucuri. Part of this required a major reorganization. “We had our own personnel taking care of maintenance for Line 1,” he explains. “But, we didn’t have enough people to handle Line 2 as well. So, Mucuri contracted with a mechanical, an electrical/instrumentation, and a predictive maintenance company to do maintenance on Line 2. This was good for the start-up, but there was kind of a wall between the two lines. Since June 2009 we have been operating with both lines being maintained by our own employees. We’ve been able to coordinate and standardize much better now.”



## SIMULATION AND WEB-TRAINING

Vitor Wuo leads Suzano’s project activities when it comes to automation and simulation. Wuo and his team were responsible for the implementation of the automation systems during Mucuri Line 2 project. It was an extensive effort, as the production line is heavily automated.

Part of the implementation included the IDEAS Simulator: a tool to help checkout a distributed control system (DCS) before start-up and to train operators to run a process – in a safe virtual environment before the mill ever starts up.

“It is very important,” Wuo says, “for the DCS and Simulator to be totally integrated.” By this he means that the DCS configurations are transferred to the Simulator so that it perfectly emulates the process. “The screen on the Simulator looks exactly like the screen on the DCS,” he explains. “There is no difference to the operators between operating a virtual process or the real one.”

Considerable work has been done by ANDRITZ Automation Solutions to build the mathematical models on which the Simulator relies. However, for each project effort is required to precisely model a specific mill. “We were very much involved in gathering data and providing our input to build the models for Line 2,” Wuo says.

The results? In Suzano’s case, there is a good benchmark as to the benefits of the Simulator. Line 1 was started up in 1992 with conventional training. Line 2 used the IDEAS Simulator. “The Line 2

operators achieved a 30% faster learning curve (ramp-up to full production) than did the Line 1 operators,” Wuo says.

And now, Wuo’s interest is in web-based process training from ANDRITZ. “The web tools in combination with the Simulator are perfect for us,” Wuo says. “Our target is to have our own operators start up a line – not the equipment suppliers. Web training and dynamic simulation bring us closer to this target.”

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Vitor Wuo, head of all automation projects





## ANDRITZ SCOPE MUCURI LINE 2

### Woodyard

The ANDRITZ woodyard consists of three complete wood-receiving and chipping lines for forest debarked logs, chip storage, chip screening, and bark handling.

- Each chipping line, capacity 280 m<sup>3</sup> sub/h, is equipped with a log feeder deck, Euca-Roller™ bark separation system with washing, and a horizontally fed HHQ-Chipper™.
- Chip storage is an open circular system utilizing the latest blending bed technology with a rotating stacker-reclaimer. Storage volume is 94,000 m<sup>3</sup> and a high reclaiming capacity up to 1,800 m<sup>3</sup>/h.
- Chip screening is performed after the chip pile using three CS 1000 gyratory chip screens.

### Fiberline

The fiberline is designed to produce high brightness eucalyptus pulp at a rated capacity of 3,160 t/d. Included in the ANDRITZ delivery are:

- Four Drum Displacer® (DD) Washers for brownstock and post-oxygen washing.
- Post-oxygen pulp screening with two CombiScreen™.
- Four stages of ECF bleaching utilizing DD Washers and the patented A-stage process for reducing chemical consumption.

