

“Breakthrough” strategy is focused on making incremental improvements in operations and management processes, the so-called “continuous improvement” best practice.

— *By JOHN YOLTON*

VCP’s Jacarei mill, located near Sao Paulo in Brazil, produces 2,590 mtpd of bleached eucalyptus market pulp on two fiberlines.



Collaborative Asset Optimization Program Boosts Reliability Numbers for Brazil Mill

Asset Optimization (AO) is receiving good press lately... and why not? Getting better results from existing processes is definitely a best practice. During a recent trip to South America, I was fortunate to visit one mill site in particular that understands the strategy of asset optimization and has taken action to implement their hybrid version of collaborative asset optimization.

During this visit, I interviewed Luiz Marcelo Piotto, reliability manager at Votorantim Celulose e Papel (VCP) in Jacarei, Brazil, who discussed the use of AO at his mill as well as the company’s Piracicab, Brazil, mill. VCP began its journey toward AO during 2000. The difference between other attempts and that being practiced at VCP Jacarei is the “collaborative” performance-based effort.

Latest Technology, Market Oriented

VCP’s Jacarei mill is nestled in the picturesque valley of the Paraiba do Sul River, located just 50 km from Sao Paulo, a sprawling city of more than 12 million inhabitants. The Jacarei integrated pulp and paper mill produces 2,590 metric mtpd of eucalyptus market pulp, on its way to a goal of 3,000 mtpd. The mill consists of two fiberlines (B & C), a free sheet paper machine (90,000 mtpy) and an off-machine coater (75,000 mtpy).

The mill’s fiberline B was started up in 1997, while the new fiberline C was commissioned in late 2002/early 2003. Needless to say, technology deployed at the site is relatively new and at or near state-of-the-art. The mill is supplied with fiber from nearby eucalyptus plantations. These “cloned” trees provide consistent quality fiber, thereby reducing variations in product that, in turn, can cause production disruptions.

The mill employs 200 in maintenance, out of a total mill workforce of 850. This group of maintenance workers is supplemented with some 100 outside contractors because they possess special skills or use special equipment. Within the maintenance workforce there are two fundamental skills classifications, e.g., mechanical primary with basic electrical and electronic primary with mechanical secondary. The maintenance organization includes planners.

Of the 200 maintenance employees, there are 50 “mechatronics”. This term, coined by Piotto, indicates a combination of mechanical, electrical and instrumentation skills, e.g., mechanical/electronics. The goal is for all maintenance employees to be trained as mechatronics within 4 to 5 years.

Piotto's vision for the future includes a work force that is well trained in skills necessary to maintain complex, highly automated processes requiring high availability. "Trying to remain competitive without a well-trained workforce is costly," Piotto explains. "Investing in education is an easy decision."

Much of the work performed by the mechatronics is initiated by a group of engineers in the mill's Reliability Engineering (RE) group. This group of focused professionals is tasked with developing strategies to improve the various process systems within the mill. As well as possessing solid engineering disciplines, each is also well versed in mill processes, a combination essential for making improvements.

"Impacting business goal improvements without understanding the process is nearly impossible. That is why we expect our reliability engineers to be fully immersed in their assigned areas of responsibility, so they appreciate the reason an action must be taken," Piotto says. "We envision building an improvement process that could be labeled a "living program"—striving for continuous improvement."

Tasks for this group include:

- Root cause failure analysis
- Suggesting and then managing corrective actions
- Monitoring and administration of the core PM program
- Redesign and modifications aimed at improving operations and facilitation
- Administration of all reliability improvement efforts.

The reliability engineering group has grown to 14 people today from just two people in 1997, another indication that reliability as a business process has taken hold at Jacarei.

Breakthrough Strategy

Mill management is implementing a "breakthrough" improvement strategy. The strategy deployed recognizes that many global competitive facilities continue making incremental improvements in their operations and management processes, the so-called "continuous improvement" best practice.

"Playing 'catch-up' under these circumstances with a like strategy of continuous improvement would fail to make the operation a world-class competitor," Piotto notes. "Unless the latest technology is deployed and effective manufacturing reliability strategies are pursued, we will never become competitive."

Knowledge-Based Manufacturing Reliability

While the mill's overall vision for competitiveness includes every aspect of the operation, e.g., production, administration, and supply chain, the manufacturing reliability strategy focuses on data collection, information analysis, and effective asset management. This knowledge-based maintenance (KBM) concept relies heavily on information and the capability to archive, research, report, plan and execute.

Starting in September 2000, as part of the breakthrough strategy, the mill's reliability management decided to expand on a concept first attempted six years earlier. At the time a performance-based agreement was established with a sealing vendor to supply and maintain mechanical seals used throughout the mill. This early attempt at collaborative improvement led to the latest agreement, under which the mill contracted with SKF Reliability Systems to provide all of the technical assistance to collect and analyze vibration data and provide the staffing for and administration of lubrication needs.

Piotto explains that "we don't have a choice. We need to have people on site who understand the language (of vibration). This allows our own people to spend their time fine tuning the operation, for example, 'loop tuning' where we can achieve significant incremental capacity increases or quality improvements."

VCP recognized the risk/benefits with this collaborative alliance. In VCP's case, the risk of not moving forward is the loss of production due to unexpected downtime caused by equipment failures that potentially would not be proactively identified. VCP's analysis of the risk/benefits indicated that the benefits far exceed the risk. As Piotto observes, "The company [SKF] has a very good culture to make this long-term relationship work."

Implementation

SKF Reliability Systems has responsibility for all vibration monitoring and lubrication. They employ some existing maintenance personnel while supplementing the crew from outside. The staff is located on the mill site and has become an integral part of the mill's overall reliability effort.

According to Piotto, "SKF has to know the problem before us. Our hope is that they solve the problem even before they notify us."

Utilizing state-of-the-art online and handheld condition monitoring hardware and software, a highly trained, skilled group analyzes vibration signatures periodically collected from critical equipment in order to provide information to the reliability engineering group to avoid unexpected, unscheduled process failures.

The lubrication team performs the routine tasks of PM routes, while continuously upgrading lubrication for troublesome equipment. Wherever possible this includes installation of automatic lube devices, particularly in unsafe or out-of-the-way, hard to reach locations. "Automating processes to eliminate non-value-adding effort is a fundamental element of our improvement process," Piotto adds.

On a daily or as-needed basis, SKF RS personnel meet with the planners to notify them of potential problems that should be included on schedules. A formal meeting is held monthly to review the contract and the results to date.

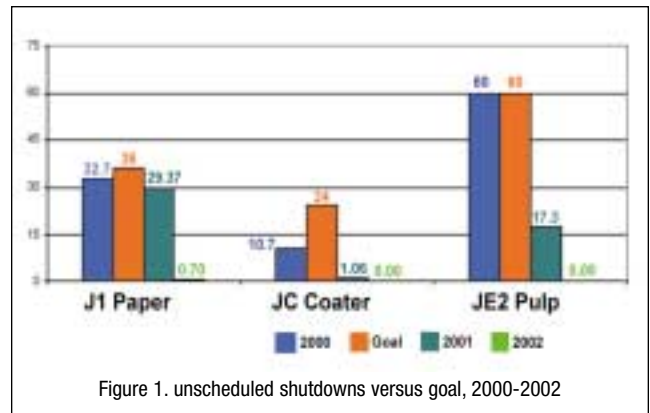
Results, Benefits

Performance criteria are well established to provide added incentive for continuous improvements in both costs and reliability.

These criteria include:

- Off-machine coater lost time
- Paper machine lost time
- Fiberline lost time
- Recovery boilers lost time
- Crew safety
- Total market pulp production.

As reflected in Figure 1 in terms of improvements in unscheduled downtime, results of this collaborative asset optimization effort have been outstanding. The



underlying philosophy employed in this effort is summed up by Piotto: "We don't manage for costs, we manage for reliability."

Additional benefits include:

The mill was recently cited by the Innovest Group (www.innovestgroup.com) as the Best Environmentally Managed Operation in Brazil and eighth best in the world, based on research by their EcoValue 21 rating methodology.

Piotto believes that development of the collaborative reliability process has had a profound effect on the mill's workforce, "We all feel that we are celula de gesto de ativos (asset managers)," he points out.

There is clear indication that a cultural modification has taken place and that reliability has become a mind set with the mill's employees, from the very top to the bottom.

Conclusions

VCP – Jacarei's established business goal is to become world class market pulp and coated free sheet paper providers. Certainly, one tactical element of this strategy is the development of a solid reliability improvement program. Incorporated within that strategy is the use of knowledge, expertise, and tools provided by collaborating partners willing to share the risk and reward for reliability improvement.

Following a well-thought strategy, VCP–Jacarei has certainly achieved "breakthrough," and the timeliness cannot be ignored. ■

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