

Success Story

Teaching an Old Mill New Tricks: Abitibi – Sheet-Break Reduction Initiative Delivers Million-Dollar ROI in Nine Months



Challenge

There are so many assets in a typical mill that a failure-based maintenance model has become the norm. As maintenance personnel attempt to correct pressing problems based on operator reports and scheduled preventative maintenance visits, underperforming control assets are often overlooked.

Solution

Engineers surveyed three continuous monitoring packages and found that Matrikon™ Control Performance Monitor satisfied their criteria for a continuous control-loop monitoring tool. The application is targeted at improving control performance while simultaneously lowering the long-term cost of sustaining the performance of control assets.

Advantage

- Real-time asset monitoring and analysis
- Move from reactive to proactive maintenance methodology
- Reduced variability
- Improved product quality
- Prevention of unplanned downtime

Control Performance Monitor is Powered by Matrikon, which represents vendor neutrality. This product works with third-party control systems and applications.

Extracting More Value from Process Control Investments

Extensive process automation is a common feature of modern pulp and paper mills and a key component of competitive business strategies. As such, modern distributed control systems (DCS) along with associated regulatory process controls constitute a significant part of a plant's asset base. In addition to the initial investment, control infrastructure requires long-term maintenance costs and management responsibilities if these assets are to continue providing business value.

In the current climate of rapid change, constrained resources and increased competition, plant management has focused on extracting more value from instrumentation and control investments to improve performance and profit margins.

Abitibi-Consolidated is a global leader in newsprint and uncoated ground wood. Their pulp and paper mill in Fort Frances, Ontario

produces 279,000 MT of value-added paper and 99,000 MT of NBSK market pulp per year.

A continuous improvement initiative provided the impetus for exploring new strategies to reduce variability, develop a proactive approach to maintenance and increase return on production assets. Engineers proposed implementing a control asset monitoring solution on critical control loops in their Kraft mill. With this implementation, personnel hoped to move from a reactive maintenance methodology to a more proactive one by identifying and repairing poorly-performing control loops before they negatively impacted plant profitability.

Control Performance Monitor Meets Requirements

The desired solution would allow personnel to continuously monitor a large number of control loops simultaneously. Further requirements included:

- ease of use to enable staff without process-control backgrounds to understand and use the tool.
- ease of maintenance to reduce service calls.
- the ability to identify poorly performing control loops and failing hardware.
- non-intrusive implementation that did not require modifications to the DCS or plant historian.



Figure 1: Plant area specific components

Engineers at the Fort Frances Mill surveyed three continuous monitoring packages and found that Control Performance Monitor satisfied their criteria for a continuous control-loop monitoring tool.

Control Performance Monitor provides an automated means of assessing and monitoring the performance of all of assets in the control hierarchy up to and including the advanced control layer.

The application is targeted at improving control performance while simultaneously lowering the long-term cost of sustaining the performance of control assets. Designed to integrate with existing plant maintenance processes, it is compatible with all commercial DCS and data historians.

Results

Control Performance Monitor was implemented on 350 control loops in the Kraft mill and a number of loops in the ground wood mill. In total, the system provides continuous monitoring, diagnostic and tuning tools for just under 400 loops.

Abitibi staff began by using the tools to identify loops that were cycling and to determine whether this was due to a malfunctioning control element, poor control tuning or a disturbance-related problem. Maintenance efforts were directed to address the costliest problems first.

Six months after purchasing and applying Control Performance Monitor in the Kraft mill, the process control team completed a study on the mill's bleach plant, focusing on the 25 control loops around their R8 chlorine dioxide generator, where efficiency could be easily measured by comparing the quantities of input chemicals to the amount of chlorine dioxide produced. The study revealed three types of control performance problems and generated a quantifiable benefit in detecting and correcting these problems.

The system helped engineers detect a control problem with the R8 generator's level controller that was impacting product quality and generation efficiency due to excessive chilled water addition, causing liquor concentration deviations from their optimum. Level in the R8 generator was regulated using an on-off control configuration. As level in the generator dropped below a desired set point, the make-up valve was opened fully until the set point was met, at which time the valve would fully close.

The result was a dramatic reduction in chilled water use and liquor concentration deviations.

In the four months prior to implementing the new control strategy, water was added to the generator at a rate of 140 hours per month. After the redesign, the figure was reduced to 12 hours per month. This improvement reduced generator operating costs, simultaneously improving generator efficiency and product consistency and quality.

In the same period prior to the implementation of Control Performance Monitor, the generator had an average operating efficiency of 88.7%. Fewer than 10 of the 25 loops audited were found to have problems, though some of these performed so poorly that they had been switched over to manual control. In the four months following the implementation on the R8 generator, the average efficiency rate rose to 93.4%, representing a cost savings of close to \$400,000 annually.

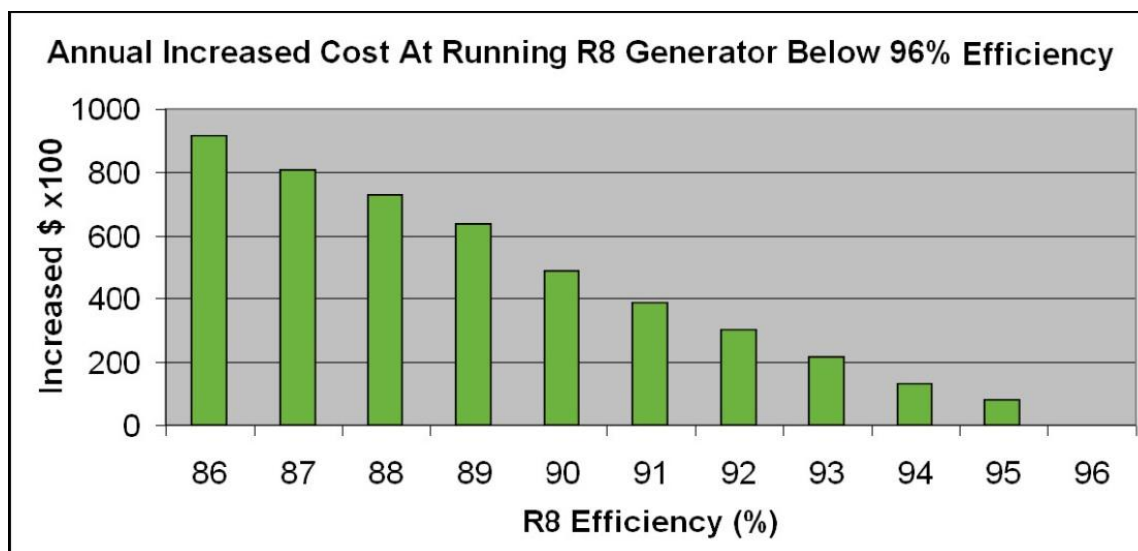


Figure 5: R8 Efficiency improvement from 88.7% to 93.4% saves almost \$400,000 annually

Control Performance Monitor's continuous monitoring capability provides control engineers and maintenance staff at Abitibi's Fort Frances Mill with a valuable tool for doing control maintenance proactively and for detecting process problems unnoticed during routine maintenance. The use of a real-time asset monitoring and analysis system in conjunction with a control-tuning package has helped mill staff move toward proactive maintenance work processes to maximize the effectiveness of available resources while reducing variability, improving product quality, and preventing unplanned downtime.

About Abitibi-Consolidated

Abitibi-Consolidated is a global leader in newsprint and commercial printing papers as well as a major producer of wood products, serving clients in some 70 countries from its 45 operating facilities. Abitibi-Consolidated is the largest recycler of newspapers and magazines in North America, diverting annually approximately 1.9 million tons of waste paper from landfills. It also ranks first in Canada in terms of total certified woodlands.



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