

Fraser Papers Saves Over \$2 Million Annually with Upgrade to DeltaV™ System, PlantWeb™ Architecture

RESULTS

- Reduced startup costs
- Reduced bleach chemicals consumption
- Increased chlorine dioxide generator efficiency
- Increased production capacity
- Reduced off-quality pulp
- 1.9% mill efficiency increase
- Improved product quality
- Reduced environmental impact



APPLICATION

Pulping & bleaching

CUSTOMER

Fraser Papers Inc., a wholly owned company of Nexfor Inc., produces 700+ tpd of fully bleached softwood pulp for use at its fine paper mill in Madawaska, Maine.

CHALLENGE

Fraser sought a way to reduce bleaching costs, improve pulp quality, and increase the efficiency of ClO₂ generation.

SOLUTION

Emerson engineers audited the mill and made recommendations, including installation of pre-engineered, turnkey automation systems called CyberBLEACH™ and CyberWASH™. These solutions are based on the PlantWeb™ digital plant architecture including the DeltaV™ digital automation system for all process areas, replacing an existing distributed control system that controlled the bleaching process and chlorine dioxide generator. The project was a joint effort of the Emerson Process Management Pulp & Paper Industry Center, Atlanta; Laurentide Controls, Emerson's local area representative headquartered in Montreal; and mill personnel.

Selected control valves, bleach plant sensors, and field instrumentation were also replaced. Newly installed intelligent Fisher® valves with

“The \$2.2 million savings and accompanying 1.9% mill efficiency increase have exceeded expectations of the project. Pulp production has been running at levels never before thought possible, ClO₂ generator efficiency and stability is much improved, chemical bleaching costs are stabilized, and quality has improved slightly.”

Robert Duncan

Process Engineering Supervisor, Fraser Papers, Edmundston Mill.



For more information:
www.EmersonProcess.com/DeltaV



FIELDVUE™ digital valve controllers, Rosemount® transmitters, Micro Motion® Coriolis flowmeters and Rosemount Analytical devices all perform online diagnostics. The bulk of the installation was completed as the mill continued to operate, and final conversion to the new technology was completed during a seven-day shutdown period. The new bleachery control room has three operator workstations, each with dual monitors. The control system includes an application station and engineering station. Two remote workstations—one in the sulphite foreman's office and the other in the technical office—are used for monitoring various operations and information gathering. The main control strategies involve automatic startup and shutdown sequences, production rate controls, pH and chemical residual controls, delignification degree and brightness development controls, "virtual" sensor calibration and pulp tracking.

Automated startup and shutdown sequences for the three major processes—washing and screening, bleaching, and chlorine dioxide generation—were key factors. These processes, which were formerly started by pushing a series of buttons manually, are now safely started or shut down by pressing just one button. What once took longer than an hour to complete is now done in less than 30 minutes, enabling more pulp to be processed.

Robert Duncan, process engineering supervisor at the Edmundston mill, reported that a plant efficiency increase of 1.9% has been attributed to the advanced controls now in place. In-depth evaluations conducted more than a year after the control system was commissioned revealed a number of economic benefits, including:

- Reduced chemical usage
- Increased chlorine dioxide generator efficiency
- Improved pulp quality

Substantial reductions in chemical dosages have been recorded in each of four stages through improved pH measurement and control using filtrate extractors. The kappa number of unbleached and extracted pulps is carefully monitored in line, allowing greater kappa factor control and thus application of a minimum amount of chemicals for efficient bleaching. The kappa factor actually decreased by 7.3% and total equivalent chlorine demand has decreased by almost 3%. Duncan estimates that a 13% reduction of bleaching costs has been achieved.

The Solvay chlorine dioxide generator was running well beyond design capacity and, consequently, its efficiency had dropped below the desired target. By automating the controls, installing improved flow measurement devices and revamping the control strategy, the efficiency of this unit increased by 2.4%, Duncan said.

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