

CASE STUDY

# USA paper mill maximizes their automation investment with ABB services



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01 Cyber-attacks on process control systems can have more serious consequences than those on commercial IT. IT departments must therefore develop an understanding of the requirements for the protection of IACS networks.

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Service tools cut time needed to identify and address equipment issues by 55%

### Background

Over 30 years, a large paper mill in the United States has worked closely with ABB to continually optimize automation equipment performance and, as a result, increase productivity, maximize uptime and raise product quality.

The mill produces more than 400,000 tons per year of specialty papers on four machines. The mill also has a woodyard, a bleached kraft pulp mill with eight batch digesters, four boilers, a coater and converting operations.

### ABB equipment

As the product mix diversified and printing and converting equipment evolved, so did the need for more consistent quality. Variability reduction is an important part of the mill's continuous improvement. Three of the four paper machines had ABB Quality Control Systems (QCS) installed. ABB supported the mill with several weeks of optimization services, including a Paper Machine Fingerprint assessment on a paper machine in 2009. In 2010, ABB won the order to replace this machine's QCS with an ABB system. The mill chose an ABB 800xA QCS that included two ABB Network 1200 scanning platforms, one at the size press and one at the reel. The mill selected the ABB QCS system for improved caliper measurement and control.

### ABB service

In 2010, the service contract included one ABB resident engineer. In 2012, based on performance and on the fact that all the mill's machines now have ABB QCS, the mill signed a five-person resident service agreement with ABB to provide maintenance, tuning, and optimization on the systems. The service agreement was renewed in 2015 due to the ability of ABB to demonstrate how its resident engineers exceeded the original contract scope and provided higher customer

02 The ServicePro data routinely collected shows the value provided by ABB in decreasing the number of system failures. The ABB service team used ServicePro to significantly reduce the number of hours of lost productivity. When comparing the first half to the second half of the 2012-2015 contract, Preventive Maintenance increased by 10%, which drove Total Corrective Maintenance and other Maintenance down almost 5%. The decrease in the total number of Corrective Maintenance and Maintenance hours improved, reduced overall maintenance costs, and freed up service engineers to provide additional value-added services.

03 By increasing preventive maintenance based on best-practice routines and schedules that are in ServicePro libraries, ABB was able to reduce unplanned and corrective maintenance costs year over year.

value by using the ABB ServicePro Service Management System to schedule and track all maintenance activities.

The long-term relationship between the mill and ABB has given ABB a deep understanding of the mill's people, processes and goals. ABB has applied this knowledge to the way it provides services to help the mill achieve lasting gains in productivity, equipment availability and paper quality.

**ABB service delivery tool**

The ABB resident service engineers at the paper mill use ABB's ServicePro Service Management System, an interactive software tool featuring ABB's best maintenance practices, to manage service delivery at the mill. ServicePro ensures a maintenance approach with measurable results. ABB resident service engineers are able to track work order completion and the contract hours spent on work orders, so that they can efficiently manage service scheduling and downtime activities. Additionally, ServicePro provides detailed reporting features that tracks hours worked by the resident service engineers and the number of incidents during the reporting period. Service delivery data reported through ServicePro shows the value added by ABB in increasing machine efficiency and decreasing the number of system failures.

The maintenance activities are scheduled and tracked using three categories:

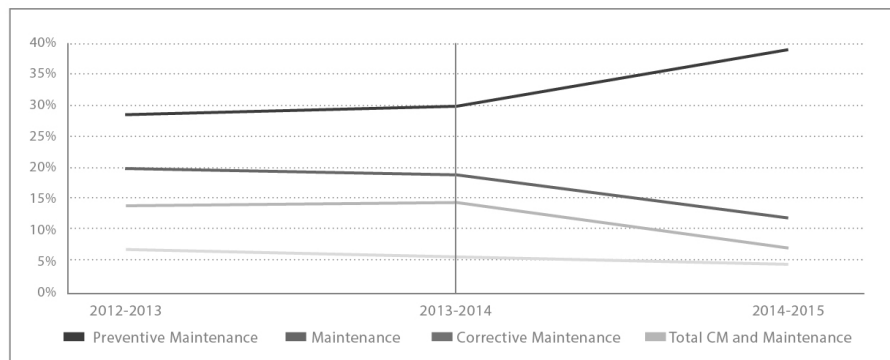
1. Preventive or scheduled maintenance
2. Maintenance of equipment issues found during Preventive Maintenance and addressed on a scheduled maintenance day with no unplanned downtime
3. Corrective. These are equipment failures that affect system performance with the repair made during non-scheduled maintenance time.

When best-practice preventive maintenance routines that are a standard part of the ServicePro libraries were executed at the mill, Corrective Maintenance hours due to system failure dropped by 55 percent, resulting in higher QCS and production availability, and less Corrective Maintenance.

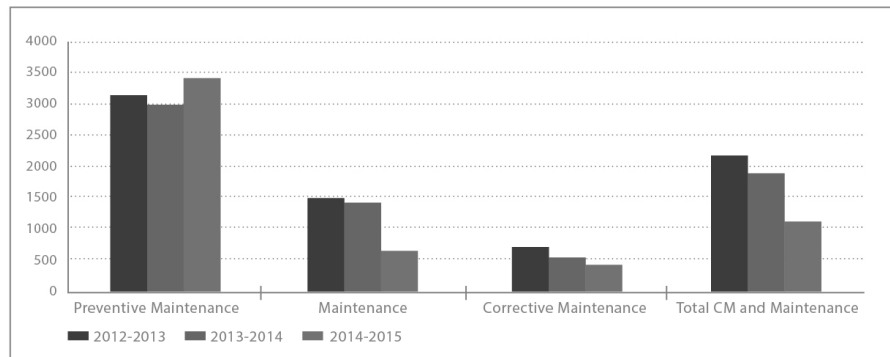
Due to this reduction in corrective maintenance hours, ABB service engineers are spending their newly available time to focus on increasing overall mill productivity. For instance, ABB resident engineers helped the mill to implement a control strategy using ABB headbox actuators that control the paper thickness and density profile. After ABB configured the controls, tuned, tested, and validated them, the yield increase was immediate. Two months later, this same

process was implemented on a second machine with equally significant yield improvement. The increased yield from this new control strategy is worth over US \$190,000 annually.

The ABB service agreement was renewed and expanded in 2015 when ABB's resident engineers exceeded the original contract scope and provided higher customer value by using ServicePro to schedule and track all maintenance activities.



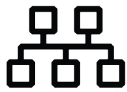
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### ABB advanced services

This customer relationship was further strengthened when the mill agreed to become a pilot site for ABB Advanced Services powered by ServicePort. ServicePort is a secure, remote-enabled service delivery platform deployed at customer sites that gathers and processes large amounts of data, and performs initial analysis, so that ABB experts can more quickly help customers find and mitigate variables that impede productivity. On one of the mill's paper machines, ABB engineers deployed the following Advanced Services:



**System 800xA Performance Service:** uses data collected during scheduled and on-demand analyses for comparison against best practices and standards to detect performance irregularities. This comparison quickly pinpoints issues, helping to improve system reliability, availability and performance. Data is classified based on established Key Performance Indicators to provide a list of items that are prioritized based on severity, criticality and/or financial impact.



**Loop Performance Monitoring Service:** includes a series of platform-independent, non-invasive services that can be applied to any automated process or control system to benchmark, correct and sustain performance. Recommendations for improvements are delivered in a detailed report, prioritized based on resolutions that deliver the greatest benefits.



**Loop Tuning Accelerator Service:** reduces the time between diagnosing potential Proportional-Integral-Derivative (PID) control loop issues and tuning the loops to address the issue. It uses control data already gathered, analyzed and stored to quickly identify issues, so that corrective tuning can take place to ensure full utilization of the control system and availability of the production process.



**QCS Performance Monitoring Service:** identifies, classifies and helps prioritize opportunities to improve product quality, measurement and control health, and control utilization. This service uses non-stop data collection and analysis to transform raw data into actionable information by quickly pinpointing issues to ensure optimal performance of equipment and systems



**QCS Transition Performance Service:** identifies, classifies and prioritizes opportunities to optimize transition times controlled by the QCS. The service uses automated data collection and analysis to quickly identify issues and ensure optimal transitions, such as product grade and shade changes.

Over the years, the paper mill has been instrumental in helping to improve the quality of ABB's advanced services offerings through their input. The latest version of the ServicePort software is operating at the site, which allows both ABB resident engineers and mill process engineers to benefit from the data analysis. The ABB onsite team works closely with the mill's operations to enhance the system's capabilities and help to resolve process issues quickly.

### Results and customer benefits

- Reduced on-call maintenance and increased customer satisfaction.
- Continued confidence in the mill's ability to achieve optimum uptime and productivity
- Customized plan for performing automation maintenance
- Improved efficiency and time savings
- Increased opportunity for engineers to provide value-added services