



Paper Products Manufacturer Improves Manufacturing Processes with ProcessLogix

Rockwell Automation's
Information & Automation
Systems (IAS) designs system
to improve pulp mixing and
waste water processing

Application Profile

Industry Overview

Paper manufacturers producing high-volume consumer items are faced with ever-increasing set of challenges. With global competition intensifying, the days are gone when a few select regions of the world dominate the pulp and paper industry. Global production capabilities are increasing, intensifying competition at all levels. Profit margins are shrinking as even higher value-added products have become price-sensitive.

In some regions of the world, the cost of complying with environmental regulations has had a major impact on the industry's profits. In the United States, for example, compliance with ever-changing federal clean air and water regulations means costly process changes and capital investments. For mills large and small, automation can be the solution. The following example is but one case where automation is helping return profits to the manufacturer.

Specific Application Problem

The customer required a system that would improve control of the pulping and waste treatment processes, provide for future expansion, and ensure future connectivity with existing Allen-Bradley PLCs.

Control included batch mixing of recycled paper, creating a pulp mixture that is the primary material used in the finished paper product. Mixing is performed with a repetitive mixing sequence, with the ability to vary formula. The completed pulp mixture is then pumped through a continuous process that cleans and filters the pulp mixture that is then stored in holding tanks for use on the paper product forming machine.

In addition to the primary pulp making application, the proposed system would be required to control a secondary wastewater application. The system would maintain liquid levels, temperature, aeration, and monitor the pH level to enable the breakdown of the waste materials resulting from the pulping process which would then filtered from the effluent.

The Previous Control System

The controls on this process had been updated in an incremental fashion over several years. They included dedicated loop controllers, hardwired pushbuttons and pilot lights, hardwired control logic, and a third-party PLC.

Potential Solutions

The system integrator spent considerable time up-front discussing present and future application requirements with the paper product manufacturer's process and control engineers, assuring that they understood immediate and potential requirements that would be placed on the control system. The integrator recommended a ProcessLogix solution, since the analog control content was fairly high and ProcessLogix's embedded continuous control tools would result in decreased application development time, driving the overall cost of the new system down. The trending and historian feature native to ProcessLogix was another reason this control platform was selected by the system integrator, and approved by the customer.



Bringing Together Leading Brands in Industrial Automation

Specific architecture

The system control architecture consists of a ProcessLogix Server that, like traditional DCS systems, maintains a global database of all process functions. This simplifies system integration and expansion, since information on the server is readily accessible to multiple system servers and ProcessLogix Controllers. To assure maximum up time, redundant servers were added during system development. Multiple PC-based operator stations running Station software are located in the main control room, with two additional stations located in the company's engineering area. Engineering and operator workstations communicate to the system's servers over Ethernet.

At the control level, two non-redundant PLX52 Controllers share overall control requirements. Located in the main control room, controller 'A' is connected to the motor control centers, and the secondary wastewater application. Controller 'B' is connected to the operations floor, pulper, heat exchanger, flash spray, and back basement portions of the pulp making application. Each of these areas contains at least one I/O rack housed in NEMA 12 or 4X cabinets. Communications from both controllers to their associated I/O control racks is provided via separate ControlNet links.

Key to this application was the use of the global tag database functions inherent in the ProcessLogix system. The I/O was geographically assigned; however, some of the control algorithms were resident in the processor that was not directly connected to this I/O. The ability of the ProcessLogix system to "transparently" exchange data and I/O information between the processors allowed for the control schemes to be created in a way which more closely matched the process rather than where the I/O was connected. When

commissioned, the system contained approximately 450 points, with over 200 of these being analog, including about 50 loops.

Integrator-Specific Expertise

IAS, an internal Rockwell Automation integration service, has been designing, integrating, and commissioning process and discrete control systems based on Rockwell Automation hardware and software for many years. Experience gained automating many different type of manufacturing processes has been brought to bear on this application. In particular, IAS's experience in batch systems requiring an integrated blend of discrete and analog control was extremely useful in providing an economical solution for this customer.

Anticipated Results of the new system

Customer expectations are high for the newly commissioned paper products manufacturing process. Because of the ease of implementing both process and discrete functions, the customer anticipates that integration will go quickly, thereby lowering the costs of bringing the system on line. The ability of the ProcessLogix system to enable operation of one control module at a time has proven to be invaluable to the customer as they go through the process of switching over from their old controls to the new system without interrupting production. The customer anticipates plantwide connectivity to their existing and future installations of PLC and ProcessLogix based systems. ProcessLogix provides many options for plantwide connectivity over ControlNet, Ethernet, and other networks. Finally, they anticipate better pulp due to more consistent blend of the recycled paper stock and the improvements in data collection and analysis afforded by the system.

IAS System Integration

As one of Rockwell Automation's Approved Process System Integrators, IAS specializes in

process control applications across several industries including paper. Founded in 1982, IAS has integrated thousands of process and manufacturing applications. The IAS in-house staff consists of process control experts who have provided solutions that have made their customers successful. IAS is based at Rockwell Automation's CIG (Communications and Information Group) Headquarters, located in Mayfield Heights (Cleveland), Ohio. IAS integration services are available at many locations world-wide, and are marketed to our customers by the Rockwell Automation Sales Channel.

Rockwell Automation

Historically, Rockwell Automation's brands have developed and marketed a variety of products and services into the process control industry. After introducing the original PLC controller in the early 1970's, we began providing an expanding line of analog I/O modules, enabling our controllers to be used in process as well as discrete applications. Over time, the PLC controller was further enhanced with the introduction of industrial networking, expanded instruction sets for PLC controllers, improved MMI packages, and process-oriented software packages. Today, Rockwell Automation plays an even more important role in the process control industry. Technology exchanges with multiple DCS companies have quickly brought Rockwell Automation's process control products on par with the best product offerings in the industry. With the recent formation of the Process Business Unit, there is a focused effort to assure multiple products integrate cleanly at the component level, leaving the system integrator free to develop the user application instead of spending valuable time making components 'talk' to each other.

Reach us now at www.rockwellautomation.com

Wherever you need us, Rockwell Automation brings together leading brands in industrial automation including Allen-Bradley controls, Reliance Electric power transmission products, Dodge mechanical power transmission components, and Rockwell Software. Rockwell Automation's unique, flexible approach to helping customers achieve a competitive advantage is supported by thousands of authorized partners, distributors and system integrators around the world.

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