

ONGUARD™ *i* CONTROLLER

Successful restart of pulp mill with automated boiler water chemistry control

Situation

A bleached softwood fluff pulp mill in the southern U.S. had been idle for several years. Prior to idling, the pulp mill had operated with a base-loaded recovery boiler along with power boilers that handled load swings and maintained steam header pressure. The mill was reconfigured prior to re-starting and after re-start, the recovery boiler (1500 psi, 103 bar) was the only boiler in operation under normal conditions.

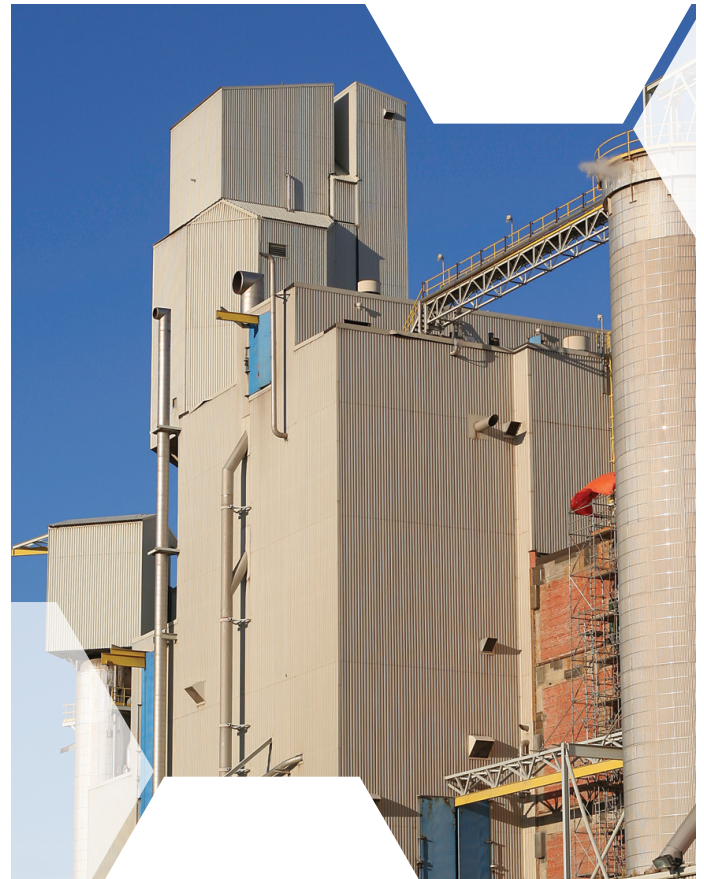
Recovery boiler reliability is always critical, but in this situation, reliability became even more important to the mill. Because the mill considered boiler water chemistry to be a significant aspect of their recovery boiler reliability program, they decided to pursue water treatment program improvements with automation desired specifically.

Customer Objectives

- Implement an industry best practice boiler water treatment program and improve control compared to prior program.
- Implement a boiler water treatment automation system that would:
 - » Deliver the required chemistry control improvements
 - » Allow remote access to view monitoring and control processes
 - » Deliver around-the-clock notifications of system upsets should they occur
 - » Minimize mill personnel involvement in boiler water treatment and chemistry control

Recommended Solution

The Solenis team studied the system and developed a comprehensive program to not only meet, but to exceed mill expectations. First, they recommended a boiler water treatment program consisting of the following Solenis products: Amercor™ 1848 corrosion inhibitor, Amersite™ 2230 oxygen scavenger, Amertrol™ 1010 deposit inhibitor, and Amertrol™ 3510 deposit inhibitor. This program has proven to provide excellent corrosion and deposition control in paper mill and other high pressure boilers around the world.



Next, the Solenis team recommended the implementation of an OnGuard™ *i* controller to monitor and control the boiler water treatment program. The OnGuard *i* controller utilizes proprietary artificial intelligence software to control the phosphate and pH chemistry in the boiler and enables more precise chemistry control than any other commercially available technology. The OnGuard *i* controller includes alarm notifications via cell phone and email. The user can configure notifications for any event, including emergency stops, chemistry out-of-specification, analyzer reagents are low, etc. Mill personnel and Solenis personnel were able to respond to the alarm notifications, monitor process conditions, and adjust control parameters remotely via secure cellular VPN connection to the OnGuard *i* controller,

Most notably, the OnGuard *i* controller “learns” from its observations of the system and from the responses to its corrective actions. As a result, the OnGuard *i* is able to determine and implement the most effective corrective actions during normal and abnormal operation, and during system upset conditions. This helps to prevent potential chemistry excursions that would likely occur with manual control or with conventional automation systems.

During the pulp mill re-start, the Solenis team of sales and applications and equipment engineers provided 24/7 on-site coverage for an extended period and worked closely with the mill personnel to ensure that the identified objectives were met. Mill personnel were able to focus on other critical areas of the operation while the Solenis team provided operations support and consultation for all aspects of the mill’s water treatment programs including clarification, demineralization, boiler feedwater treatment and boiler internal treatment. Cooling water treatment programs were also started and maintained by the Solenis team. Solenis’ integrated support proved to be a critical component in the successful re-start of the mill.

Improved chemical control with OnGuard™ *i* controller

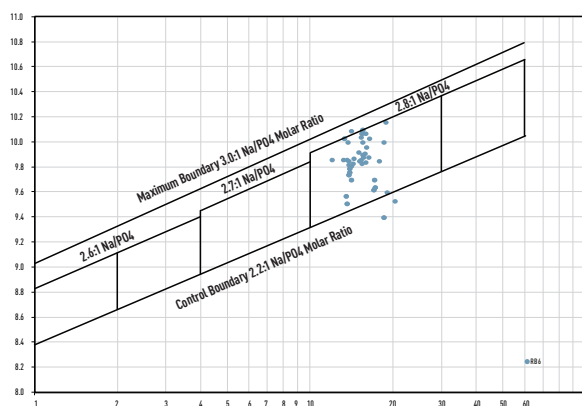


Fig 1: pH/PO4 control before installation of OnGuard *i* controller (42 data points, 7 day period)

Pinpoint Accuracy

The recovery boiler operated in a base-loaded mode with power boilers maintaining steam header pressure prior to idling of the mill. Data collected during this time indicates that the chemistry control, even though 100% manual, was very good as compared to industry standards. It should be noted that it is generally easier to maintain boiler water chemistry control when a boiler is base-loaded boiler compared to if it is required to handle load swings and to maintain steam header pressure. See Figure 1.

When the pulp mill was re-started, the recovery boiler operated with ever changing conditions as the only boiler in operation during normal conditions, making control more difficult. Implementation of the OnGuard *i* controller, however, provided the improved accuracy and precision of control needed in order to achieve the mill’s recovery boiler reliability goals. As shown in Figure 2, the OnGuard *i* controller was able to deliver extremely accurate and precise control of the recovery boiler water chemistry with a significant improvement over manual chemical feed and control.

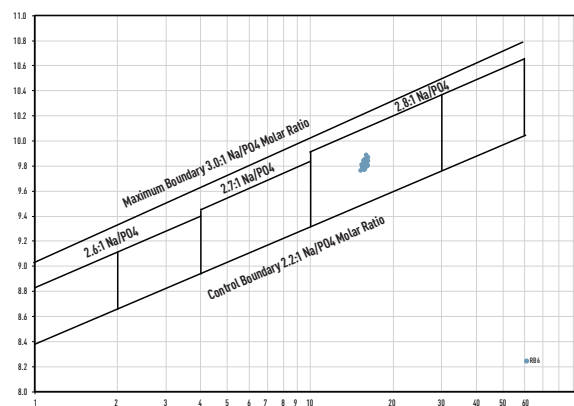


Fig 2: pH/PO4 control after installation of OnGuard *i* controller (42 data points, 7 day period)

Customer Benefits:

The Solenis program, which includes both an extremely reliable water chemistry program along with the state-of-the-art OnGuard *i* controller, provided the following benefits for this fluff pulp mill:

- Improved recovery boiler and production reliability through greatly improved water chemistry control
- Improved operator efficiency through reduced time requirement for boiler water treatment
- 24/7 monitoring with call out and email capability
- Ability to respond quickly and remotely to upset conditions via secure cellular VPN connection

Conclusion:

The OnGuard *i* controller, when coupled with the expertise, dedication and commitment of the Solenis support team, provided reliable, accurate and precise boiler water chemistry control and required minimal involvement by mill personnel. This comprehensive Solenis program allowed mill personnel to concentrate on operating and improving other aspects of the mill. Recovery boiler reliability improved and pulp mill productivity increased. This provided a significant return on investment for the mill.

More Information

For more information about Solenis products and services, please contact your local Solenis field representative or visit Solenis.com.

