

## World's Largest Single-line Pulp Mill in Brazil Minimizes Downtime with Robust Instrumentation

**Location:** Três Lagoas, MS, Brazil  
**Order date:** April 2011  
**Completion:** December 2012  
**Industry:** Pulp & Paper



### Executive Summary

Eldorado Brasil Celulose (hereinafter Eldorado), established in 2009, operates a newly built pulp mill in Três Lagoas, Brazil. It currently has a single pulp line that is the world's largest, capable of producing 1.5 million tons of bleached pulp per year. The pulp is extracted from a 100% renewable source, planted eucalyptus trees, and is exported to paper producers in South America, North America, Europe, and Asia in compliance with all applicable technical and sustainability standards.



For the full control of all the facilities at this plant, including the wood yard, delignification, recovery boiler, causticizing equipment, lime kiln, and power boiler, Yokogawa provided the CENTUM VP distributed control system (DCS), Plant Resource Manager (PRM) asset management system, Exaquantum/ARA alarm management system, and Exaquantum/SER integrated sequence of events and trip reporting system. The DCS uses an open communications protocol to connect with other plant subsystems, ensuring the integrity of processes and equipment. The ProSafe-RS safety instrumented system (SIS) was also installed on the fiber line and the biomass boiler to fulfill the respective functions of emergency shutdown system and burner management system.

In addition, Yokogawa engineers worked with engineering, procurement, and construction (EPC) contractors to install more than 2,500 field instruments at this plant, including flowmeters, analyzers, and pressure transmitters.

Thanks to good collaboration between Eldorado and Yokogawa's project personnel, the startup of this large-scale pulp mill was completed without delay. The plant has maintained stable production operations ever since, with no significant safety issues or downtime.

Yokogawa América do Sul Ltda. was involved in this project from an early stage, beginning in early 2011, when it assigned personnel to work closely with Eldorado to identify the best technologies for the new plant, with a focus on having sustainable industrial processes and ensuring stable operations with a minimum of downtime. Yokogawa's dedicated engineers subsequently implemented the instrumentation systems and set up the control room for this modern, highly automated plant.



Eldorado presented Yokogawa this award plaque for being the best supplier in the field instruments category.

## The Challenges and the Solutions

### On-time installation and commissioning

While this project was underway, the instrument specifications were changed several times with the aim of improving efficiency. Despite this, Yokogawa was able to complete all installation and commissioning work without falling behind schedule, and this can be attributed in part to the company maintaining close communications with Eldorado. Involvement from the early stages of this project enabled Yokogawa to give advice on how to most effectively configure the instrumentation and integrate it with systems and products from multiple vendors. The design, construction, and commissioning of this plant was completed in record time, just two years. Yokogawa’s timely completion of its work on this project was a significant contributor in this, enabling Eldorado to meet its deadline for the startup of production.

### Optimum operation by integrated systems

To enable central control of the entire plant, all of its subsystems are integrated with Yokogawa’s CENTUM VP DCS. Exaquantum/ARA is able to access data from the DCS to generate a report for the statistical analysis of alarms and events, which can then be used to identify and correct areas of concern. Exaquantum/SER is an event-driven reporting system whose data is used to analyze the root cause of problems and make corrections to prevent their recurrence. For example, Eldorado experienced some events of trips early in the plant startup process. To identify the cause, trip and sequence information was analyzed using data drawn from throughout the plant, focusing on the crucial periods directly before and after each event. The integrated database eased cross-platform analysis. Once the cause was identified, a correction could be made to prevent a recurrence. These solutions thus help to optimize the plant’s operations and eliminate downtime.



Quicker access to plant data with CENTUM VP’s intuitive HMI

### Uninterrupted operation with reliable and robust instruments

At its other pulp plants, Eldorado had often experienced unplanned shutdowns caused by failed field instruments. To ensure steady production, the company needed highly reliable devices that had been tested and approved for use in the pulp and paper industry. Based on its long experience in this industry both in/outside Brazil and its field-proven technologies, Yokogawa was able to provide the right product solutions. These included transmitters with multi-variable digital sensors and silicon resonant sensors that give stable and strong output in the most demanding process conditions. Additionally, Yokogawa’s PRM solution facilitates the remote monitoring of field devices from the CENTUM VP host

system, enabling the early detection of deteriorating performance. Since the implementation of these Yokogawa solutions, this Eldorado plant has operated smoothly with no downtime. The use of multivariable sensors has also been very cost effective.

## Customer Satisfaction

Carlos Alberto Fink, a project consultant with Eldorado, said, "Under the terms of a frame contract, Yokogawa worked with several EPC contractors to install a large number of instruments. I appreciate the support that Yokogawa provided to determine the specifications and the most appropriate application for each type of instrument, depending on the process conditions."

Mr. Fink went on to say, "Certain processes at pulp mills have high temperatures and other very severe conditions, and this requires a company with highly experienced and qualified people as well as products that are capable of operating under such conditions. Yokogawa was best suited for this project. This plant has been up and running since December 2012 and the instrumentation has all been functioning satisfactorily. To keep our plant operating at a high rate of efficiency, we will continue to partner with Yokogawa to receive the full benefit of their latest technologies."



Carlos Alberto Fink, Project Consultant, Eldorado

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