

# Project Description



## *Three-Level Air System Upgrade on CE Recovery Boiler Coated Paper and Hardwood Pulp Mill North America (US-South)*

### **Project Scope**

In May of 2007 JANSEN was awarded the contract to provide engineering and equipment supply for the combustion air system upgrade of a mid-sized kraft recovery boiler in operation in a coated paper and hardwood pulp mill in the US-South. This V2R unit was originally supplied by Combustion Engineering in 1969 with a capacity to burn 2.5 million lb/day of virgin black liquor dry solids (BLDS).

The unit had been in operation with its original two-level combustion air delivery system as well as cascade direct contact evaporator. Typical operation was at 3.2 million lb/day of oxidized as-fired BLDS and dry solids content near 67%.



The mill's main purpose for the upgrade was to help achieve the following operating goals (other boiler system modifications and upgrades were scheduled as well):

- Increase combustion temperatures in the lower furnace.
- Minimize concentrations of sulfur dioxide (SO<sub>2</sub>) in the flue gas.
- Increase chemical reduction efficiency of the smelt.
- In future phases, increase the burning capacity up to 3.6 million lb/day as-fired BLDS at 72% dry solids.

Upgrade elements were dictated by successful experience with several recent other JANSEN upgrades on similar units; this was confirmed by the results from CFD modeling conducted by JANSEN early in this project:

- Primary air around the periphery of the furnace (half of the existing PA ports were closed off).
- Installation of new overbed secondary air on the side walls, utilizing JANSEN High Energy Combustion Air Nozzles™ located approximately six feet above the primary ports.
- Retaining the existing upper tangential air in service as tertiary air, unchanged.

No new fans or fan modifications were required and new secondary air supply ducting and windboxes were kept to a minimum.

### **Results**

Installation of the new overbed secondary air and nozzles took place during the annual outage in November of 2007. Initial start-up was smooth as the boiler was brought up to full steaming capacity on liquor within 12 hours.

After long-term operation, the unit continues to perform satisfactory and all performance guarantees have been met.