

Project Description



Kraft Recovery Boiler

Large Paper Company

Location: North America (US)

Project Scope

In June of 2001, this mill installed 12 Jansen High Energy Combustion Air Nozzles™ at the secondary air level of the recovery boiler, originally supplied by B&W in the mid 1960s and upgraded in the late 1980s. The heat and solids loadings of this 'short and stubby' unit are uncommonly high. However, a significant portion of the boiler's steam generating capacity could not be used because of the need to cut back liquor flows due to TRS emission problems. In addition, bed control was difficult with the existing secondary air ports, as these had demonstrated their inability to provide for air jet penetration deep into the furnace and prevent char piling on the bed.



The new secondary air nozzles were placed on the left and right side walls (with five air nozzles on each side) and one nozzle on each the front and rear walls. This arrangement provides for a slight but effective rotational component to the secondary air delivery, which is beneficial in reducing carryover.

The mill had several objectives for installing the JANSEN air nozzles at the level of the secondary air:

- Eliminate shipping of black liquor (up to eight trucks per day) and keep the energy in-house.
- While increasing the liquor throughput, keep TRS below 3 ppm at all times.
- Reduce secondary air flow quantities, without causing bed control problems, therefore reducing carryover and plugging rates. Reduce boiler water wash frequency.

Early in the engineering phase of the project, JANSEN conducted Computational Fluid Dynamics (CFD) modeling and confirmed that the project goals could be met.

The patented JANSEN air nozzles were installed during the regular annual outage.

Results

The boiler is performing as predicted and the following quantitative results have become evident:

- The mill now burns all of the black liquor it generates. Boiler steam generation has increased in the range of 5% to 10%.
- TRS generation is consistently below 2 ppm.
- Convection area plugging rates have decreased significantly. The run time between water washes has increased from six weeks to over six months.

This air system installation marks the 20th recovery boiler upgraded by JANSEN to increase black liquor burning capacity and/or to reduce emissions of TRS. The scope of these upgrades has been design and materials supply or complete Engineer, Procure, and Construct (EPC) responsibility.