

Project Description



No. 6 Power Boiler Overfire Air System Upgrade Incineration of HVLC NCG Westvaco, Silsbee, Texas

Project Scope

The boiler is a VU-40 type unit, supplied by Combustion Engineering in the early 1980s to burn natural gas and bark. The MCR steaming rate of the unit is 400,000 lb/hr at an operating pressure of 625 psig and final steam temperature of 750°F. The typical steaming rate prior to the upgrade was around 350,000 lb/hr from waste wood.



The old overfire air (OFA) system consisted of four large air ports located near each corner of the furnace. The ports were aligned to create a tangential flow pattern in the furnace. The arrangement of the original OFA ports was ineffective, and mill operations had essentially shut them off.

The mill is in the process of installing a high volume low concentration non-condensable gas (HVLC NCG) collection system, and had selected the No. 6 Power Boiler for disposal of these gases. With the OFA system upgrade, the mill had several objectives:

- Eliminate burning of natural gas.
- Minimize emissions of CO, NO_x, and particulate.
- Provide for reliable incineration of the HVLC NCG stream.
- Reduce carryover of ash and char.

In September of 2001, the new JANSEN OFA system was installed utilizing four custom sized Jansen High Energy Combustion Air Nozzles™ on each of the side walls for the injection of the OFA. Two of these nozzles were adapted to also inject the future HVLC NCG stream. Computational Fluid Dynamics (CFD) modeling conducted by JANSEN for this boiler had demonstrated that the new OFA nozzles would provide excellent mixing, burnout of wood materials and volatiles, as well as destruction of components in the HVLC NCG stream. As with most JANSEN OFA system upgrades, FD fan modifications/replacements were not needed.