

Project Description



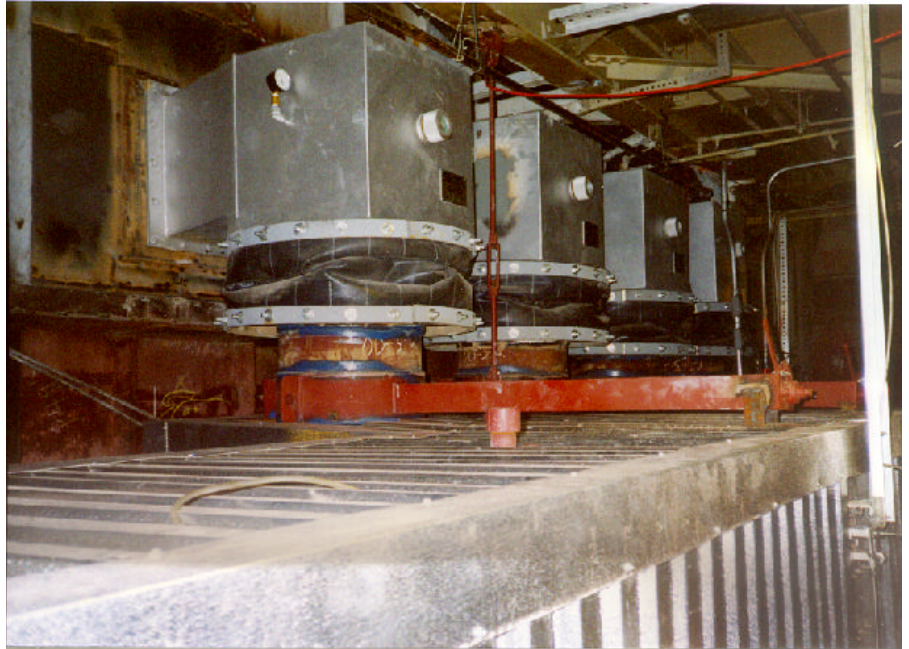
No. 6 Bark Boiler Overfire Air System

Mead Paper

Chillicothe, Ohio

Project Scope

In the spring of 1998 JANSEN was contracted by Mead Paper in Chillicothe, Ohio, to provide engineering and equipment supply for an overfire air (OFA) system upgrade on their No. 6 Bark Boiler. The boiler was originally a Combustion Engineering chemical recovery boiler that was converted to burn waste wood in 1978.



Prior to the upgrade, the OFA system consisted of many small pipes arranged in two levels on the front and rear wall. The OFA was unable to penetrate into the middle of the furnace, which resulted in high CO and VOC emissions. The small OFA ports also forced Mead to operate the boiler with high undergrate air flows. This caused high ash carryover from the grate and high unburned carbon content in the ash. These problems made it difficult to operate the unit below the permit levels for CO and VOC without firing oil. Mead was also unable to reliably incinerate noncondensable gas (NCG) in the boiler.

JANSEN used Computational Fluid Dynamic (CFD) modeling to optimize the quantity, size, and location of the new OFA nozzles. JANSEN's design included eight large OFA nozzles on the boiler side walls (four per wall) placed approximately six feet above the grate. The OFA system was designed to inject the mill's dilute noncondensable gases (DNCG) into the furnace for incineration.

Results

The OFA system modifications were installed in August 1998. Since the upgrade, the boiler has been operating at full load on waste wood fuel only. The ash carryover has been noticeably reduced, CO and VOC emissions have been reduced by a factor of five (independent stack testing measured only 250 ppm CO at 8% O₂), and DNCGs have been incinerated reliably and efficiently in the No. 6 Bark Boiler. The owner has been very pleased with these performance improvements.