



CASE STUDY

Steam Savings: Recovery Boiler Sootblower Cost Reduction

The Challenge

A Recovery Boiler was first commissioned with a firing capacity of 3.6 million lbs/day Black Liquor Dry Solid (BLDS). The boiler was later upgraded to meet higher black liquor firing demand of 5.16 million lb/day BLDS. With the upgrade, the boiler produces 658,000 lbs/hr high-pressure steam at a pressure of 1,500 psig and a temperature of 829 Fahrenheit.

Unfortunately, this higher firing capacity also meant faster deposit buildup and tougher deposit removal. To prevent massive deposit accumulation and costly unscheduled shutdown due to the plugging of the gas passes, the old conventional sootblower system had to be operated beyond its normal parameters of operation. The sootblowers consumed 33,500 lbs/hr on average of valuable high-pressure steam. With the cost of steam around \$7/1000lb, it meant that the sootblower steam consumption cost the mill approximately \$2 million per year.

This mill faced the common challenge of keeping its recovery boiler running at its full capacity, even though the sootblower steam usage was excessive and costly. To add to

the situation, because of competitive market conditions, the cost could not be passed on to consumers. The mill was left with no option but to reduce costs.

While it is impossible to completely eliminate the sootblower steam consumption, current technology advancements have successfully reduced the sootblower steam usage to a level well below 5% of the total boiler steam production. Ideally, a sootblower system should not consume more than 2.5% of the boiler MCR.

Clyde Industries Delivers

High Performance Contoured Fully Expanded Nozzle (CFE III):

At the first project phase, the mill decided to upgrade all of their old nozzles into CFE III, which resulted in more than 25% steam savings.

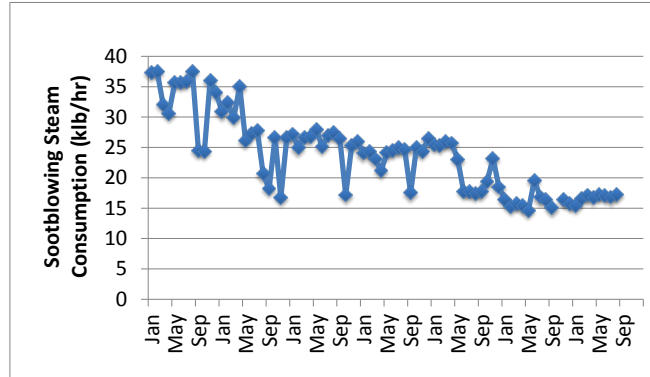
Clyde Industries's CFE III nozzle breakthrough nozzle provides efficiency greater than 90%. This higher nozzle efficiency means that CFE III can generate the same amount of cleaning power as its conventional nozzle counterpart at a much lower steam flow rate.

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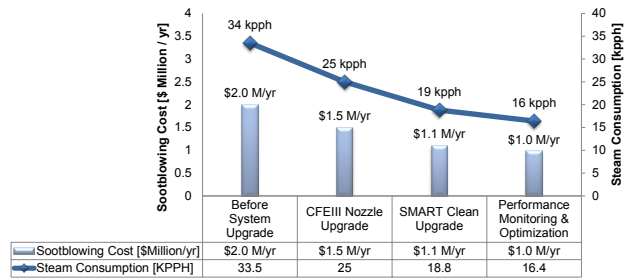
SMART CLEAN™

SMART Clean™ Intelligent SootBlowing Control System: SMART Clean™ Intelligent Sootblowing is a closed loop control system that uses a set of heat exchanger cleanliness feedback information, which is gathered online during normal boiler operations, to intelligently manage the sequence of sootblowing operation. Steam saving is achieved through a targeted cleaning strategy, which manages the sootblowing frequency and cleaning intensity based on the cleanliness of the heat exchangers. A few years later, the mill adopted the SMART Clean™ Intelligent Sootblowing system and achieved an additional 25% steam saving.

Remote Performance Monitoring & Optimization: Clyde Industries’s Boiler Performance Team was established in 2006 to meet the growing demand for remote performance monitoring and boiler optimization. The team is composed of veteran industry professionals committed to improving efficiency, driving maximum performance of your boiler, and optimizing its cleaning system/strategy. Collectively, we have experience optimizing dozens of systems nationwide. Remote monitoring and optimization are carried out through secure VPN access in collaboration with the plant’s security and information technology team to obtain critical boiler and sootblower-related performance data. The raw data is then converted into valuable knowledge and used to make informed decisions. A monthly performance report is submitted, and bi-weekly conference calls with plant engineers are held to coordinate the action plans and drive improved results. Through the final phase of the project, a Clyde Industries Performance Engineer started the remote monitoring and optimization program, which further reduces the sootblower steam usage by 13%.



Steam consumption trend upon installation of SMART Clean™ technology



Clyde Industries Inc.
 4015 Presidential Parkway | Atlanta | GA | 30340
 +1 800 241 5996 | clyde-industries.com

COMPANY WITH
 QUALITY SYSTEM
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