



## When recovery boilers go bad

**W**ith the advent of YouTube and other social media sites, throngs of average computer users have turned amateur videographers, with the need to share clips on subjects ranging from the ridiculous to the serious. Falling under the designation of “serious,” recovery boilers, I recently discovered, have made their way into the diverse culture of YouTube.

After reading this month’s article from Ribeiro, Cardoso, and Tran on “Smelt spout corrosion in a recovery boiler,” which analyzes an emergency boiler shutdown at the Cenibra mill in Brazil, I did a quick Google search on recovery boiler incidents. A link to YouTube revealed some dramatic videos with titles worthy of a Hollywood B Movie, including:

*When Recovery Boilers Go Bad Almost Burned*

*Drooling Black Liquor Gun*

*Cleaning Close to a Liquor Port*

Whether or not the videos reflected safe practices is a matter for experts, like those active in the Black Liquor Recovery Boiler Advisory Committee (BLRBAC), but the fact remains that recovery boiler safety and reliability are critical concerns for kraft pulp mills, especially as equipment ages.

A chief hazard in operation of recovery boilers is a smelt-water explosion, which Cenibra avoided in 2008 with an effective emergency shutdown procedure (ESP) when a

boiler smelt spout failed. The mill was following BLRBAC procedures and the boiler itself was just 18 years old, which is far younger than the U.S. average of 33.5 years reported by Jules Gommi, secretary of the BLRBAC Emergency Shutdown Committee. In its 34-year history, the Cenibra mill had never experienced an ESP, and the serious potential for damage from the smelt spout failure led to an extensive investigation. The findings described in this month’s article may help mills revise maintenance and operating procedures to avoid such an incident.

### Recovery Boilers at PEERS

Mill recovery boiler performance will be covered in depth at the upcoming TAPPI PEERS Conference, October 17-21 in Norfolk, VA ([www.tappipeers.org](http://www.tappipeers.org)). In addition to panels on boiler corrosion and other related topics, the following mill-based papers will be presented:

*Improving Recovery Boiler Availability - The Mahrt Experience* — An air system upgrade and a combination of continuous improvement efforts were implemented for a recovery boiler at the MWV Mahrt mill in Alabama. The goals were to improve availability and efficiency by reducing the number of sootblowers in concurrent use and extending run-time between water washes. Results of these efforts include a reduction of black liquor chloride levels by 50%, a reduction in total combustion, implementation of an automatic control

system for furnace excess oxygen, and increased total steam output to the header.

*New Sootblower Design and Strategy to Combat Plugging in a Recovery Boiler: A Mill Trial* — This paper discusses a new sootblower that improves the effectiveness of deposit removal on the leading edge of boiler banks. The new sootblower design leverages both brittle break-up and debonding mechanisms to remove deposits. Also discussed are preliminary results of a mill trial in the southeastern U.S.

*The Use of Energy Balance Around Recovery Boiler Heat Exchangers to Identify Fouling, Measure Sootblowing Effectiveness, and Intelligently Manage Sootblower Operation* — Much research has focused on optimization of sootblower jet cleaning power through improved nozzle design, but little has been done to determine optimal sootblower run timing and cleaning intensity. Many pulp mills have high efficiency sootblower nozzles, but do not have real-time feedback about fouling location. Optimum sootblowing timing not only reduces costly sootblower steam consumption, but also improves boiler thermal efficiency and prevents tube erosion. This paper discusses the use of energy balance set around recovery boiler heat exchangers at a northwestern U.S. mill.

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