

20 Tips to help Prevent Slagging

Use good walk downs and/or permanent cameras to identify slag before it becomes a problem in the SH, the plant can then shift from a “normal” to “aggressive” sootblowing/cleaning mode of operation to manage or remove the clinker online. Take Action rather than waiting for a forced outage.

Good control of the furnace exit conditions to minimize or stop slagging. (Proper & uniform O_2 and Temperature) Uniform furnace exit conditions across the furnace ($^{\circ}F/O_2$) = uniform slag deposition. (Uniform slag is more easily managed. Active monitoring of the FEGT is KEY. Operators need to be aware of FEGT to optimize their cleaning strategies and make adjustments. Trust but verify optical, acoustic and calculated FEGT. High Velocity Thermocouple Testing is the Gold standard of FEGT measurement – HVT measures bulk and discrete point temperatures.

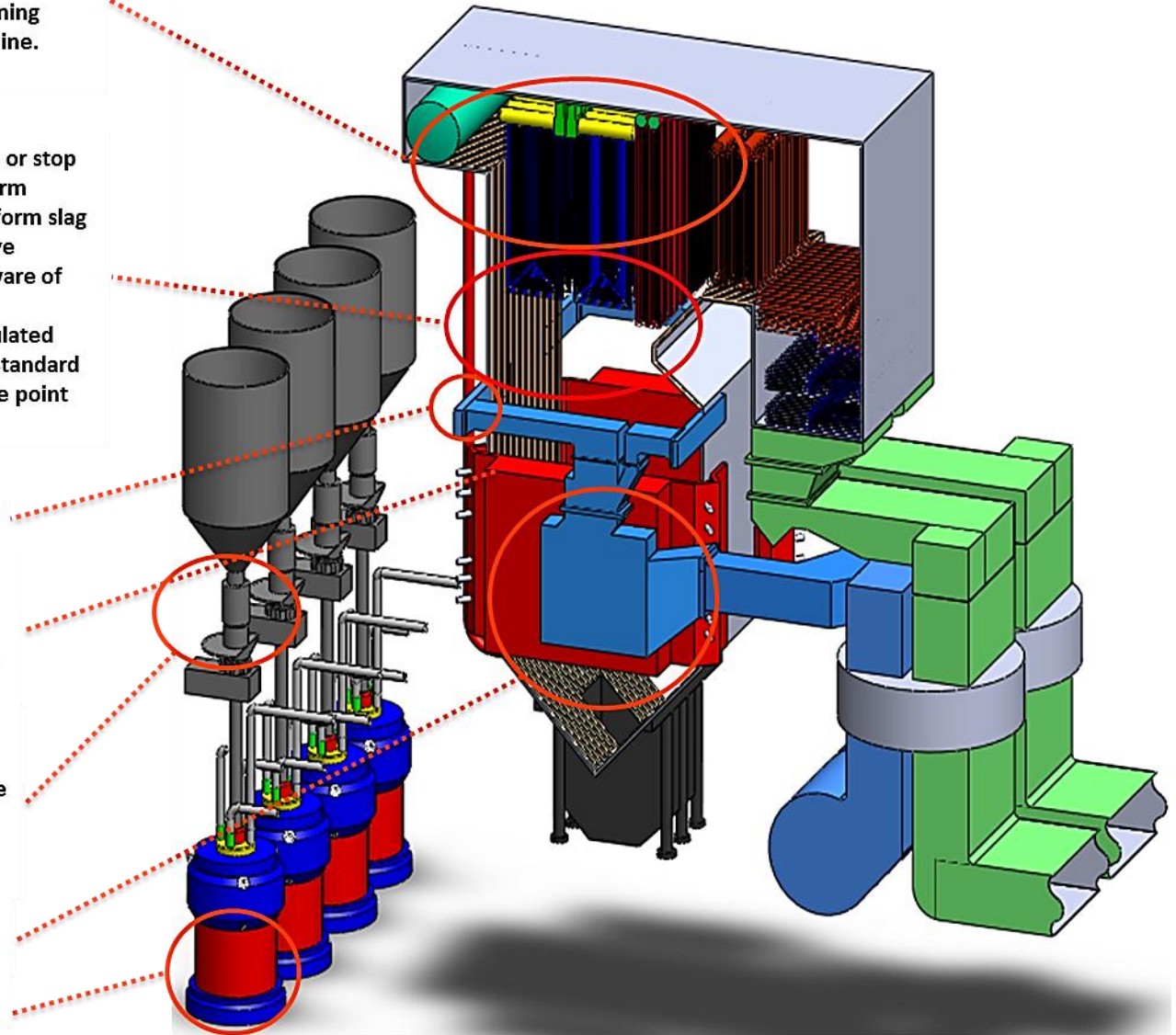
Don't overuse OFA – NO_x can be “too good” – the benefits of over-staging will be short lived

Practice “preventative” not “reactive” soot blowing by cleaning water walls, reducing FEGT and Slagging conditions. Keeping the walls clean and lowering furnace temperatures can also reduce NO_x , sometimes as much as 15%.

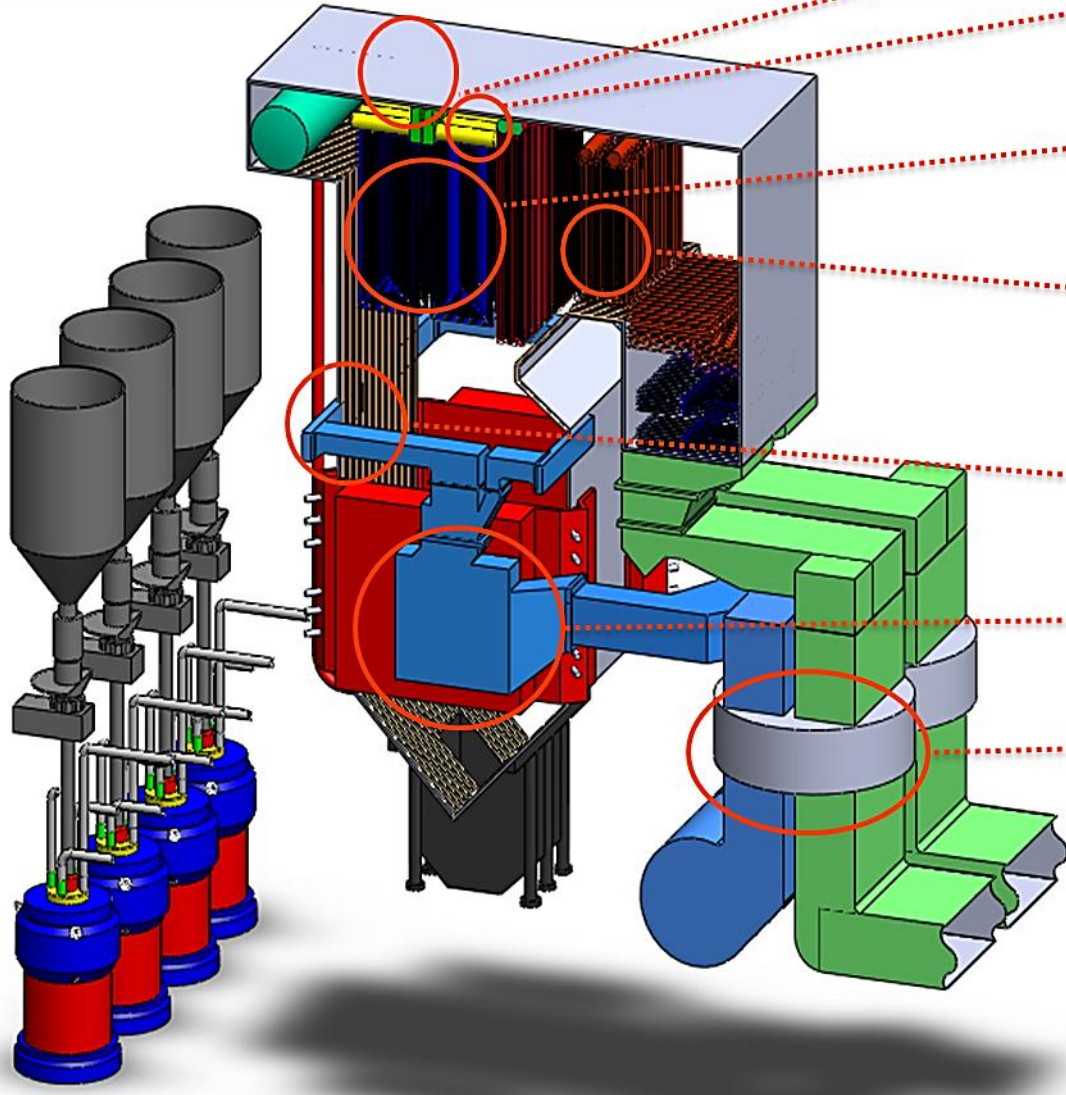
Know your coal before it enters the furnace (Operator awareness) Control the coal quality issues that you have control of, “Plant” coal quality control starts in the coal yard. Raw coal sizing, moisture (coal pile management), coal drying (mill outlet temperature) and fineness.

Optimize lower furnace fuel & air interactions to maximize water wall heat absorption.

Pulverizer performance is critical to preventing lower furnace slag/clinkers. Avoid the “splat” factor.



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Boiler setting air ingress minimized; furnace O_2 is not low with normal economizer exit O_2 .
SH/RH Heating surface areas optimized – Good steam temperatures with FEGT at or less than ash softening temperature.

Help pendant/platens clean themselves by removing slag anchor points such as certain types of wrapper tubes, alignment lugs and rigid alignment/tie bars to allow some “swinging” of the pendants.

Soot blowing technologies have also advanced a long way from a pipe with two holes – Ensure soot blower PM’s are being completed to maximize soot blowing effectiveness.

Amount of heat absorbed by the water walls regulates Furnace Exit Gas Temperature. LOOK at the water walls; know what you’re looking for. (Slagging Conditions)

Remember the boiler is a heat engine, get the inputs right. Fuel and air need to be in the right places in the right amounts.

Air heater is clean & well maintained; a high DP or Leakage doesn’t lower furnace O_2 due to fan capacity.

Practice prevention of slag rather than managing slag incidents. Listen to your boiler when it tells you it is sick; fevers – high exit gas temperatures or FEGT, hot tubes, vomiting – high spray flows, ash spills, dark bottom ash or fly ash, Shortness of breath – ID and FD fan limitations, high DP’s and low wind box pressures.