ProcessLink®

SootOpt®

Real-Time Global Sootblowing Management

Benefits

- ◰ **Improves heat rate**
- ◰ **Helps prevent tube failures and slagging**
- ◰ **Reduces NO$_X$**
- ◰ **Avoids opacity excursions**
- ◰ **Provides powerful, real time and historical data analytics**
- ◰ **Alerts of failed/stuck soot blowers**

Why SootOpt?

Maintaining the right level of cleanliness in the furnace and convection regions is one of the most critical and difficult tasks in coal fired generation. Balancing heat transfer across zones, maintaining steam temperatures and minimizing attemperation sprays are fundamental to the unit's heat rate, while tube erosion and thermal stress from over cleaning causes waterwall erosion and cracking which results in boiler tube leaks, the largest cause of unplanned outages.

Both the data needed to make optimal boiler cleaning decisions and the control functionality to enable optimal selection of individual sootblowers are available — but operators are not in a position to constantly monitor and analyze and act on data that can guide optimal individual blower activation. Locally-intelligent soot blowing systems maintain a preset level of cleanliness in each boiler zone, but do not take overall performance objectives — such as heat rate and emissions — into account when determining cleanliness targets or initiating soot blowing.

NeuCo developed SootOpt to fill this critical need and enable constant optimization to ensure optimal heat transfer and steam and gas temperature control with the minimum required soot blowing.

One of many analysis tools provided by SootOpt, the counts bar charts show actuation statistics over different time periods for each sootblowing device in a selected boiler area. This information helps build an understanding of baseline activity and identify changing cleaning patterns.

How it works

SootOpt works in conjunction with existing soot blowing controls and instrumentation — from PLC-based controls to advanced ISB systems. By using adaptive modeling, expert rules, and thermodynamic calculations SootOpt optimizes the activity of these systems. SootOpt determines the actions that will optimally balance the unit's heat rate, reliability, and NO$_X$ objectives and dynamically identifies the most effective boiler cleaning equipment and take actions in real-time.

SootOpt's objective is to clean each boiler zone with the optimal frequency — not too much or too little. To determine and pursue optimal cleaning frequency, SootOpt uses steam and gas temps, spray-flows, combustion control settings, load, etc., and can use data from more advanced instrumentation such as strain-gauges, flux instruments, fuel analysis, and manually entered data such as slag accumulation.

"Not only has SootOpt dramatically cut down on our boiler tube leaks, it also enabled us to gain 25 MW through better APH inlet-temperature control."

- Operations Manager, 4 unit 800 MW plant

The Sootblowing Optimizer makes its decision machinery transparent to staff by displaying real-time and historical data together with a statistical analysis of its decisions.

Insight and Analysis

SootOpt provides key process insights that support improved decision making. SootOpt makes its logic for zone and sootblower selection transparent to staff in standard data displays, and provides statistical analysis tools for deeper understanding.

For example, when SootOpt detects malfunctioning or ineffective sootblowers, it provides an indication of the issue directly on its analysis screens and also sends email alerts to relevant plant personnel and NeuCo's Customer Support Center. Such problems typically cause substantial boiler performance degradation and can go unnoticed for days or even weeks. SootOpt also displays analysis related to changes in soot blowing patterns, and performance differences between operator shifts.

Scalable & Flexible

SootOpt's flexibility allows it to respond to the ever-changing nature of today's power plants. Optimization goals and constraints can be easily modified to incorporate new controls and objectives, or to address additional optimization challenges.

The ProcessLink Modules

SootOpt is part of NeuCo's total boiler optimization solution and can be bundled and integrated with **CombustionOpt®** and **ProcessOpt®**.

CombustionOpt learns complex process relationships, dynamically determines — after taking SootOpt's actions into account — the optimal biasing of the fuel and air setpoints given the unit's goals and constraints, and makes the necessary adjustments to available fuel and air variables in real-time.

ProcessOpt, by continuously monitoring key process variables, helps plant personnel get a jump on emerging operational issues.